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RURAL ECONOMY

FOR

COTTAGE FARMERS & GARDENERS:

A Treasury of Information

ON

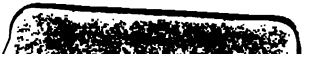
COW-KEEPING, SHEEP, PIGS, POULTRY,
THE HORSE,
PONY, ASS, GOAT, THE HONEY BEE,
AND FARM & GARDEN PLANTS.

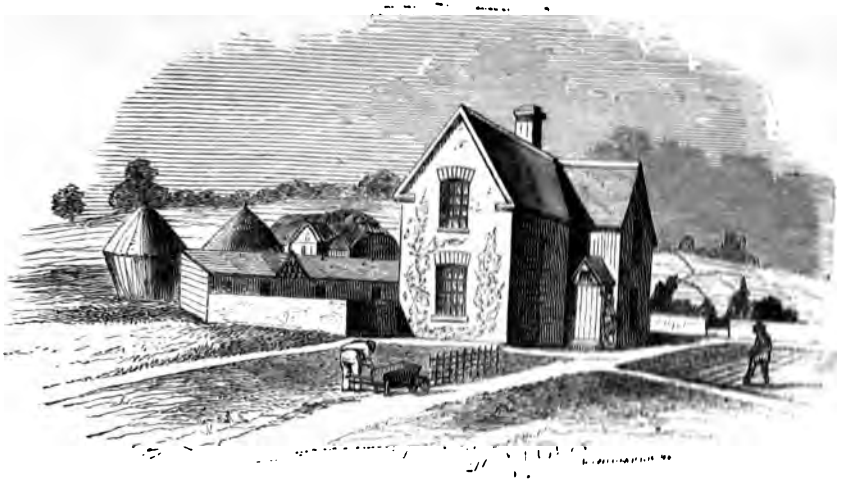
ETC. ETC. ETC.

The Sixth Edition.

BY MARTIN DOYLE & OTHERS.

LONDON:
G. ROUTLEDGE & CO., FARRINGDON STREET.





A MODEL COTTAGE.

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NEW YORK: 18, BEEKMAN STREET.
1857.

INTRODUCTION.

In order to render the arrangement of the subjects treated of in this little volume as convenient as possible, all extraneous matter has been omitted, and they have been placed under distinct and appropriate heads, so that the least experienced reader may find the point on which he seeks information without difficulty.

And in supplying to a large class of readers, who cannot afford to buy expensive and complete books, the cheap and unpretending publication now offered to them, the editors think that they are promoting that diffusion of useful knowledge which is among the best boons of a bountiful Providence to the people of the United Kingdom.

CONTENTS.

RURAL ECONOMY.

COW-KEEPING.

WHAT is the best breed of cows for dairy purposes? is a question which suggests itself at the commencement of our subject. No positive and direct reply can be given to it, because local circumstances, as to the qualities of pasturage—if the cows be pastured—climate, shelter, the means available for house-feeding, and the amount of money which the purchaser of a cow may have at his disposal, must determine the question. As to the last point, it is evident that one man may be able to buy a first-rate cow at a high price, while another can only afford to pay a very small sum for an inferior animal. Where sufficiency of food can be supplied, whether in house or in pasture, the Durham, or short-horn breed, is probably the best that can be named, as it fully combines in itself the best qualities that are desirable in a cow for dairy purposes, and for the shambles afterwards. This breed comes into profit, too, at a very early age, and is remarkably gentle. The Ayrshire, Hereford, Devon, and Suffolk, have their high pretensions also, deservedly. The Jersey, or Alderney, as the same breed is also called, is excellent for giving milk; but being a native of a milder climate then ours, it is not suited to the northern parts of our islands, unless warmly housed during the greater part of the year. For elevated situations and free pasturage, the improved Kerry

and the Kyloe are to be recommended. Of foreign breeds, the Dutch are celebrated for giving abundant milk. The good points of a milch cow are understood by every judge of dairy cattle; and cows, whose portraits would be ugly, are often the best for profit. A lady, who manages her dairy admirably, in the north of Ireland, informs us, in her agreeable manner, that she has "one dear, ugly, old Irish cow, who gives beautiful rich milk and plenty of butter," and that her seven kine, though they cannot boast of higher lineage than that of being third or fourth cousins of a respectable Ayrshire race, produce more milk than some of the most aristocratic cows in her neighbourhood.

The proper management of a cow is of more consequence than her ancestry and appearance (though these are important considerations also); and the adage, "handsome is that handsome does," is as applicable to a cow as to a human being. The plain-looking cow who gives much and rich milk, and is gentle under the milker's hand, is surely preferable to the beauty who yields a lesser quantity, and will possibly, in a capricious mood, kick the pail, and spill the milk which has been drawn from her by a milk-maid in fear and trembling.

A good cow is a fortune to a poor man; but the best one may be spoiled by mismanagement. We shall begin with the treatment of a cow from the time of her calving. Immediately afterwards, a warm bran mash or a drink of oatmeal and water, should be given to her, and during three or four days her drink should be slightly warmed; after her recovery, one oil-cake a day will be good for her, especially if there be a want of rich, succulent, green food. Swelled dugs are often troublesome: these may be reduced by frequent rubbing with a hot fomentation of bran and water; and if the teats should become chapped, from the effects of weather or other causes, they should be gently touched with Florence oil, elder ointment, or any mild unctuous matter.

The calf, if it is to be reared and not *sealed*, should be allowed to suck the cow for the first two days only: it must be immediately taught to drink new milk from the pail, as the early separation of the mother and her offspring prevents the former from becoming restless or unwilling to yield her milk to the pail. Every dairy-maid knows how to make a calf drink from a pail—by first putting a finger into the milk, putting this wet finger into the calf's mouth which she at the same time plunges into the vessel. The calf will very soon learn to drink, without sucking even a wisp of hay, which is sometimes substituted for a finger. By measuring in a pail the quantity of milk which a calf gets, there can be no mistake as to the allowance of nourishment it receives. For the first week, a calf of average size will require a full quart of new milk, morning and evening; double that allowance in the second week, and four quarts every morning and evening in the third week; then three pints of warm oatmeal gruel at each time of feeding may be put into cold skim-milk, and gradually the warmth should be diminished until the drink may be given quite cold. At ten weeks' old, the allowance of gruel may be stopped, and the milk reduced nearly to water (which will be the better for having fresh hay boiled in it) for the calf will then begin to eat bran; and at fourteen weeks' old, it will pick tender green food. Calves are often reared with less milk than is here stated to be necessary; but it is no true economy to stint them in their food, for no animal, ill-nourished in its early days, becomes large and vigorous; if the calf be of a large or valuable breed, it would be more decidedly "penny wise and pound foolish" to do so. By the method just recommended, and for which Mr. Cramp, of Lewes, obtained a medal from the Board of Agriculture, there is no reduction of butter, except a little for the first three weeks. Mr. Cramp gives a sufficient reason for not allowing the calf to run with the cow, viz., by doing so, "the cow is totally spoiled for

milk that season; for she cannot be regularly milked, and what the calf does not suck must dry away and cause a contraction in the udder, which may ever afterwards be an injury, especially if it be the first calf. In this case, every care ought to be taken to draw the milk in order to expand the udder; for want of which, many a valuable cow is spoiled for the dairy, and can never afterwards be made what she would have been if proper attention had been given at first."

FEEDING.—The milch cow should be always well-fed, but not with very fattening food. If she be limited in her food before calving, and allowed to become thin, the full-feeding afterwards must repair the waste which her body has undergone before it goes to form the milk secretions. The feeding of a milch cow throughout the year, if economy be regarded, should be in house. It is an admitted fact, that one acre in tillage, under suitable food, will go as far as three in pasture. Persons to whom economy is indifferent, and who have sweet pasture for a cow, will certainly obtain from her, on that pasture, milk and butter of better flavour throughout the grazing season, than if she were fed on artificial food and confined; she, too, will enjoy a happier life, ruminating, (chewing the cud) under the shade of a spreading tree; but if three cows can be kept in place of one—more especially on a small piece of land—economy and common sense demand their confinement. Besides, cows at pasture frequently feed on weeds, such as crow's-foot, or on the leaves of the ash tree, which impart a detestable taste to milk and butter.

If, however, milch cows be kept at grass, it is a good plan to allow them constant access to a little hay, which prevents scouring, especially at an early period of the season; and if they be confined and fed on succulent artificial grasses, a little hay may be occasionally necessary to prevent the purgative effects of the green food. The average weight of vetches, clover, and such green food for a cow, is about eighty

pounds per day. From the first of May to the first of November, she should be fed upon various successions of green food, and the more varied the better. When the various grasses have been mown for the last time and consumed, the fresh leaves of cattle beet and cabbage (the latter in small quantities, lest they should flavour the milk) will supply her with food until the roots of mangold würtzel, &c., &c., are ready for use. These roots are given with most advantage either steamed or boiled, or at least scalded with hot water, and chopped up and mixed with chaff, bran, &c., and always with a sprinkling of salt, which promotes digestion, and is otherwise healthful. Though fresh oaten straw is good for cows in winter, when they are dry, if accompanied with Swedish turnips or some other nutritious food in moderate quantities, it is not to be recommended for a milch cow in winter, when giving milk; she should then have sweet and tender hay. The quantity of roots given daily to a cow, giving milk, from November to May, may be stated at 42lbs. of mangold würtzel; 60lbs. of Swedish turnips; or 28lbs. of potatos, per day. When roots are given to a cow in their raw state, they should be cut into small pieces, as angular bits of large size would occasion the danger of choking; and a choking rope, (so called, because it prevents choking,) should be provided in every cow house. This implement, which is merely a rope bound round with leather to stiffen it, is to be thrust down the throat to remove an obstruction, or if a proper one is not at hand, a flexible whip handle may be used. Green clover or tares are apt, when taken greedily, to cause cows to be blown or *hoven*, one of the most dangerous things that can happen; it is soon known by the swelling of the stomach and the uneasiness of the animal. Immediate measures of relief must be adopted: if the danger of bursting be great, it will be necessary for a skilful person to let out the fixed air from the stomach, by introducing the point of a pen-knife; if no person be at hand to do this, the cow should be

kept moving, and not suffered to lie down, for in that state, she would probably never rise again. If danger be pressing, she may possibly be relieved by putting a green branch of elder, crosswise, in her mouth, and tying the ends fast to her horns; this is of so bitter a taste as to excite coughing, which generally brings on a relaxation of the bowels. But "prevention is better than remedy:" it is wiser to guard against the entrance of fixed air into the cow's stomach, than to depend upon any means for letting it out; therefore, clover and lucern, and such like food, should be cut some hours before it is used, in order to let the air escape, and it should be given in small quantities at a time,—indeed, food of any succulent kind should be supplied in very moderate quantities, and with intervals of two hours between each time of feeding.

A cow, in confinement, requires much hand-rubbing, to keep her skin in a healthy state and prevent the annoying irritation in it which, without such care, she would suffer from high feeding and want of open air and exercise; she should, therefore, be curried and brushed. This grooming will have the best effects on her health; indeed, if it were only for appearance sake, this attention to cleanliness is called for. The flanks of a cow become daily clotted with the dirt in which she almost invariably lies, especially when fed upon succulent food, and the adhesion of this matter to her skin is abominable in itself, and disgraceful to the cow-keeper. A cutaneous heat is apt to attack well fed, closely confined cows, and fattening cattle particularly; but constant grooming is the best preventive of it. The animal shows its satisfaction at having its skin rubbed smartly and frequently, and the labour thus expended in promoting the circulation of her blood and assisting the old hair to give way to the new, is well repaid in the improved condition of the cow.

The hours of milking should be very regular, and generally once in twelve hours, this time being neces

sary for the due secretion of the milk; some cows, however, have such a flow of milk for the first three months after calving, and more especially in the months of May, June, and July, when succulent food is abundant, as to require to be milked three times a day—the milk of such cows, however, loses in richness as it gains in quantity; but for a person who sells new milk and makes no butter, a milch cow of this kind is very valuable. If any portion of the milk of such a cow should be used for butter-making, it should be that which is milked in the morning, after the night's secretion. The lady to whom reference has before been made, is in the habit of having her cows milked three times a day for the first three months after calving; and three of them yield about twenty-four quarts per day, the others about twelve or fourteen quarts, but the milk of these is exceedingly rich, and they probably are as valuable for butter-making as those that give double the quantity of milk. There are good authorities, it must be admitted, for frequent milking, provided the intervals are regular, on the supposition that frequent milking gives additional tendency to the secretion of milk, but undoubtedly the *butyraceous* quality will be deficient in milk that has not been twelve hours collecting in the udder. As to the operation itself of milking, the late Mr. Cobbett's observations are excellent: "Cows should be milked *clean*. Not a drop, if it can be avoided, should be left in the udder. It has been proved that the half pint which comes out *last* has twelve times, I think it is, as much butter in it as the half pint that comes out *first*. The udder would seem to be a sort of milk pan in which the cream is uppermost, and of course comes out last, seeing that the outlet is at the bottom. But besides this, if you do not milk clean, a cow will give less and less milk, and would become dry much sooner than she ought."

CHURNING AND BUTTER-MAKING.—Some persons churn their milk and cream together, others the

cream alone. The lady who has favoured us with the details of her practice, has been in the habit of churning every day, and with a produce of butter at each churning, in the proportion of from nine to ten pounds from every fifteen gallons of milk, from April till October, and every other day from that period until towards spring. The quantity of milk which a cow will give throughout eleven months of the year is very variable, but no cow can be considered a good one which does not give, with good keeping, eight quarts per day. A cow should be allowed to go dry from six weeks to a month before calving; whenever the milk has a saltish taste, it is a proof that the cow should be milked no longer. Where a single cow is kept, it is better to churn the cream only once a week. Except in very cold weather, the cream will be thick enough for skimming from the cooler, which should be of zinc or tin, that is easily kept sweet and clean, and put into an earthenware crock. When a sufficient quantity of cream is collected, it should be put into a churn of suitable size and good mechanical construction, such as the lately introduced American one, by which the butter may be separated in a very short time from the cream. In cold weather, it is necessary to warm the churn by pouring boiling water into it some minutes before it is used; the water, of course, is to be thrown out before either milk or cream is put in it: this is better than heating the milk itself. If the dairy be kept sufficiently warm, with a pan of clear charcoal, there will be no difficulty in the churning; but without some artificial warmth in frosty weather, cream will not yield butter without a great loss of time and labour—perhaps in vain. In hot weather, on the contrary, the particles of butter, from being too soft, cannot be collected together from the cream, which it is often difficult to cool. When the churning is over, the butter should be put into cold spring water, with a little salt in it, in order to clear it from every drop of milk, and it will require to be well worked with a wooden spoon or a clean hand.

It remains only to be added, that a dairy and all its utensils ought to be kept in a perfectly clean state; that the room have a cool aspect, and no communication by a door with a sleeping-room or a kitchen, lest the milk be thereby tainted. The churn, after being used, should be scalded and exposed to the sun or air, and the cloth used for straining the milk, regularly rinsed and dried.

Fresh curd is delicious in summer: it is prepared by mixing a little rennet with cream or milk, which causes them to curdle; the former is the more luxurious drink, but the other which is more common and economical, is also, when eaten with sugar and milk, or cream, a great delicacy. The Devonshire clouted cream is remarkably good for the tea-table, and for making butter. What is called clouting is effected in the following manner:—Suppose ten or twelve quarts of new milk, which has stood twelve hours in the cooler, to be placed in a tin or earthen pan, on an iron plate heated gently by a furnace, or over a stove, on which it remains until the cream has completely risen;—when the milk under the cream, on examination, shows symptoms of boiling heat, the pan is removed to a cool place; and the new clouted cream, when quite cold, is skimmed and put into a churn or a wide open vessel, in which it is stirred by a stick, having a wide blade at bottom. By thus working the above quantity of cream, ten or twelve pounds of the best butter are obtained in a much shorter time than if the cream were some days gathering.

CHEESE-MAKING is with many cow-keepers a part of regular dairy work; but so much depends on the qualities of the pasturage, or food of whatever kind on which cows are nourished, on the number of cows kept, the temperature, season of the year, condition of the dairy and all its utensils, that it is difficult to describe accurately all the details of management by which the different cheeses are made. Nor is it necessary; the actual process of cheese-making in all cases

is conducted nearly on the same principles. As a general distinction, it may be stated that the very rich cheeses of the first quality are made with the morning new milk, mixed with the cream of the preceding evening. The inferior cheeses are made of skim-milk; and as those of the higher qualities are more or less rich according to the proportion of cream added to the new milk, so are the skim-milk cheeses more or less poor, hard, innutritious and indigestible, as the cream may be more or less completely removed.

Before the process of cheese-making can be commenced, rennet must be provided. This well-known substance is contained in the stomachs of milk-fed lambs and calves; the latter are, however, the usual sources of the supply, and the curdling acid contained in either is better than any vegetable or mineral acid, because it imparts no unpleasant flavour to the curd or cheese. It may not be amiss to state, that the English and Scotch methods of treating the stomach and its contents are somewhat different. The English method is to take the rennet out of the stomach, wash and scrape the latter, and then replace the rennet, after it has been well washed, wiped dry, and sprinkled with salt; the curdled milk and chyle are washed away, and the stomach and rennet alone are retained. Mr. Aiton, who is a high authority on the subject, alluding to this difference, says: "So far from throwing aside the curdled milk found in the stomach of a calf when killed, or washing away the chyle, both are in Scotland carefully preserved, and are found to tend much to strengthen and enrich the rennet. The curdled milk and chyle in the stomach of the calf form more powerful rennet than can be drawn from the bag alone when these substances are removed. It is the chyle formed from the rennet, or gastric juice, mixed with the food in the stomach of the animal that forms the coagulating power; and it is only from that chyle, so formed in the stomach that the bag becomes impregnated with coagulable matter more than any other of the intestines of the animal." We

believe the fact to be, that the Scotch rennet will do its work in a few minutes, whereas rennet, preserved on the English plan, may require two or three hours to curdle the milk, and a much smaller quantity also of the former will suffice: a table-spoonful of the best Scotch rennet being sufficient to coagulate thirty gallons of milk.*

The milk being of blood heat and strained into a fit vessel, a sufficient portion of rennet is to be mixed through it: if the milk be too cool, it must be raised to the above temperature, by putting a little hot water into it, and while curdling, let it be covered with a cloth. In about twenty minutes the curd will be formed, then slit it in various directions with a knife to let the whey separate easily from the curd, and skim the whey off continually as it rises. When the curd is as solid as butter, remove it, without breaking it if possible, into a sieve made for the purpose, or any vessel suitable for draining, and (with a cloth tied over it) press the curd at intervals of time, gently and gradually with a weight, in order to free it from the remaining whey. The curd should then be cut up into little pieces with a cheese knife (which is an implement of peculiar construction,) and thoroughly salted, and then put into a cheese vat, or mould, pierced with holes at the sides and bottom, and pressed heavily three hours at a time every twelve hours (the cloths being regularly changed) until every drop of milk has oozed away, and the cheese is completely consolidated. The after-management consists in sprinkling salt over the cheese and keeping it dry, clean, and in a warm place until it is sufficiently hardened. As to the colouring substances, such as annatto or grated carrot, used for giving a yellow hue to the cheese, they are useless at best: some of the stuff used for lacquering the outside is decidedly noxious. The only difference in the manufacture of new milk and skim-milk cheeses is, that the latter re-

* Rural Cyclopædia.

quire less care. It is satisfactory to know that the keeper of a single cow may make good cheese on a very small scale.

A cream cheese, fresh and well made, is a real luxury. The best way of making one is to put the cream in a cloth into a small flat mould, from which the milky matter may drain off. With leaves or rushes over it, it can be turned over and pressed with the hands through the cloth without being touched by them. The temperature in which it is kept should be as much as possible uniform. A cream cheese may be made in very short time, as follows:—To a pint of cream, (warmed) add a little rennet; after it has stood for an hour, put it into a sieve, on the bottom of which a cloth is laid out. After twenty-four hours transfer it to a suitable mould, and cover it with a wet napkin, on which a board is to be moderately pressed. The addition of the rennet ripens the cheese for eating the second day.

The following is an American recipe for a butter-milk cheese:—"The contents (butter-milk) of my churn," says the writer, "I put into a pot, which I hung over a slow fire. The butter-milk curdled, and the curds sunk to the bottom of the pot. I then poured off the whey and worked the curd as I would other cheese, giving salt to the taste, which was about half the quantity given to skim-milk curd. The curd was then put into a clean, coarse cloth, tied tight, and hung from the ceiling to dry for a few weeks, when the cheese was fit for use. If a bit of butter be worked into the curd, and the cheese kept for three or four months, it will then be very good.*

Some of the Germans use potatos in cheese-making. The process is described in the same periodical, from which we take the following abridged report of it. When a sufficient quantity of mealy potatos has been boiled and become cool, peel them and reduce them to a pulp by bruising. To five pounds of this

* Quarterly Journal of Agriculture.

pulp add a pound of sour milk and some salt; knead the mass perfectly, then cover it and let it stand three or four days, according to the temperature of the weather; then knead it again, put it into a sieve to drain thoroughly; let it be dried in the shade, and finally put it in layers into a crock, in which it is to remain fifteen days, when it will be eatable, though its quality will improve with age. Potato cheeses, if kept in a dry place, and perfectly excluded from air, will, it is said, keep fresh for many years. These cheeses have the peculiar advantage of not becoming worm-eaten. The proportions may be varied; for instance, two parts of curdled milk may be put to four parts of potatos, or four parts of milk to two parts of potatos. The housekeeper may make her own trials of these.

THE SHEEP.

THE sheep is one of the gentlest of the animals which God has created for the food and clothing of man. This creature is useful to us in various ways. Its flesh feeds us; its milk supplies cheese; its fat, besides the uses in cookery, supplies us with candles and ointments and materials for soap; its wool clothes us, and serves for bedding, carpeting, and other articles of furniture, and affords employment to multitudes of men, women, and children, in various trades, and amusement to ladies who delight in knitting, netting, and rug-making. So important are the uses to which the fleecy covering of a sheep is convertible, that the Drapers' Company originally intended to adopt this motto: "No ram, no lamb; no sheep, no wool; no wool, no woolman; no woolman, no spinner; no spinner, no weaver; no weaver, no cloth; no cloth, no clothier; no clothier, no cloth-worker, fuller, tucker, shearman, or dresser." The milk and cheese of sheep constitute in many countries a chief article of human food. Even the horns, which in some varieties are common to both sexes, are useful to the button-maker; glue is extracted from the trotters, and the skin serves for parchment, book-binding, gloves, and other purposes for which leather is useful. In a practical and brief sketch such as this is designed to be, it is unnecessary to distinguish more than a few of the principal varieties of the sheep reared in Great Britain, where they have been brought to greater perfection than in any other country in the world.

The improved Leicester or Dishley, which is of the long-woolled class (though their wool is shorter than that of the long-woolled sheep generally); the Southdowns and the Cheviots (short-woolled); and the

Blackfaced (with long coarse wool), are sufficiently distinctive for our purpose. Without particularly noticing any of the intermediate kinds and useful crosses, we may point to these as the best types from which a farmer may propagate a stock suited to every locality in the United Kingdom, from the most luxuriant pastures of Leicestershire, to the most elevated and barren mountains of Scotland and Ireland.

The Leicesters arrive early at maturity, and fatten to a great weight, and their form is beautiful to one who views them as mere living masses of mutton, and likes to feel a thick lining of fat on the ribs and shoulders and other parts. This breed, too, has an early aptitude for fattening on rich pastures (for which alone they are designed) and have fleeces from 5 to 7 inches in length of staple, but as the meat is not delicately flavoured, it is frequently rejected by some butchers' customers; and as the fat is laid on the external parts, where it is often of disgusting and very *uneconomical* thickness, a preference is given, in all places to which the breed is suitable, to the Southdowns, which *die* better, as butchers say, having the fat more equally and more internally deposited, and less accumulated on the external parts of the shoulders and loins, &c. The Leicesters also are not considered as prolific, nor as good nurses, nor as hardy, nor as easily trained to confinement as the Southdowns. These have not such unwieldy bodies as the Leicesters, with legs disproportioned to the bulky bodies which they have to support, and are active and handsome On the chalky and gravelly soils of Sussex, in which county they have existed since the time of the Norman invasion, no sheep can thrive better; and for general purposes, in all the lowland counties of the United Kingdom, they seem to be preferable to any other kind. In Berkshire, as in Sussex, they are almost the universal breed maintained, and for general objects, there seems to be no good reason for not preserving the pure breed unmixed in that and all other districts to which they are suitable.

The CHEVIOTS, which have been from the earliest times bred on the Cheviot hills, in most parts of the highlands of Scotland, and many of the central and northern parts also, have been improved by the sheep breeders' care. Though they have not that depth in the breast, and breadth in the chine which the better-fed lowland sheep possess, and are inferior in carcase compared with the Leicesters (the ewes only weighing from 12 to 14 lbs. a quarter, and fat wethers from 16 to 18 lbs.) they are well suited for the scanty herbage and ungenial winter temperature of the hills of our northern latitudes. They thrive among moors and peat mosses, and in the severest weather are left to shift for themselves, unless the depth of snow be such as to render it necessary to give them hay, or oats if the elevation of the land be so great as to render impracticable the conveyance of hay to them—turnips in such case being out of the question. As the length of their legs enables them to range about in search of the herbage on which they subsist, and their fine fleece is so close as to resist the severity of winter, they would prove a valuable stock in the mountain districts of Ireland, where they would enjoy a much more favourable temperature, and be always certain of finding a sufficiency of pasturage, without the necessity of scraping off the snow with their feet, as they have learned to do on their native hills.

The BLACKFACED, of which breed both sexes have horns, (the Cheviots are without them in either,) are more suited, however, to the very high and heath-covered mountains of Scotland, as they also are to those of great elevation in Ireland, because, though inferior to the Cheviots in size, and neither arriving so early at maturity nor fattening so readily, they are a still more hardy race, and can subsist on the heath shoots which are not sufficient for the Cheviots. These highland and hill sheep, as may be supposed, are only reared on the highlands; they are sold afterwards to the lowland graziers, who feed and fatten them on good pastures, and possibly coax them to eat turnips,

by half-starving them into a relish for such unwonted delicacies.

The age of a sheep is known by its teeth until it attains its fifth year, after that period there is no certainty of its age. The eight incisor front teeth of the lower jaw, with which the lamb is born, give way successively to others, which replace them year by year in pairs: thus a shearling has two new teeth in front; a two-year old, four; a three-year old, six; and a four-year old, the full set of teeth.

The ewe goes twenty weeks with young; and the period for lambing varies according to circumstances. It is deferred longer in the colder parts of our country, where scanty vegetation and harsh winds would be so unfavourable both to the ewes and the lambs in the earlier months of spring. In the milder climates of our midland and southern counties, where shelter and juicy food are provided for the nursing mothers in the first months of the year, the season of lambing takes place early; and there are some breeds of sheep, the Dorsetshire for instance, (which are mostly horned) that will breed at almost any time of the year, and are therefore highly valuable to farmers who desire to have lambs dropped at Michaelmas for supplying house lamb in the London markets between Christmas and the usual season. Lambs designed for the early markets should have bruised peas or oats (the former preferable) put into a trough for them as soon as they will nibble at them, which will be at a few days' old. Ewes, whether before or after lambing, should never be allowed to lose their condition. The growth and vigour of lambs that are to be kept on, are greatly promoted by early feeding; therefore they should never be stinted in their natural supply of milk, for if they are deprived of their full allowance of it before the proper time of weaning, say at twelve weeks (though in some districts they are allowed to run with the ewes until August, in order to admit of cheese-making) they will sustain a loss in vigour which cannot be compensated by the gain in cheese

or in milk which is sometimes abstracted from the use of the lamb for the children of hill cottagers. The ram lambs not intended for breeding purposes, are usually incapacitated from propagating their kind at the age of three weeks, (at which period the tails of lambs are usually docked off,) but in some cases the important operation alluded to is deferred until the beginning of autumn, in order to promote greater size, and vigour of constitution.

The management of sheep varies much in different districts of the United Kingdom, according to the peculiarities of soil and climate. In some localities they are grazed throughout the whole year, and only get hay if the severity of the weather prevents them from biting the blades of grass, or where natural shelter is not available for them; and sheep so treated yield the best-flavoured mutton. A flock of handsome sheep at full liberty, in a fine park or lawn, ruminating in luxurious indolence under the shade of a widely-branching tree, is a very interesting sight; and, on the contrary, a flock huddled together, as we often see them, in a cold, wet, wintry or early spring time, in the lowlands of Scotland and the north of England, on a corner of a turnip field, where they are closely penned until they have consumed every eatable mouthful, however foul and unpalateable it may have been rendered by the contamination of their own excrements, and without any shelter than that which the hurdles or a clipped and leafless hedge afford, is a painful exhibition of animal discomfort. Yet, in point of *economy*, the folding of sheep upon turnips during one half of the year, and on clover, tares, &c., during the other half, is far preferable to the old system of grazing at large, for it has been by this mode of management which keeps a due proportion of every arable farm under green crops, that the soil of England has been rendered so productive, and that such profitable employment has been afforded to great numbers of our countrymen in the manufacture of wool.

There is, however, another mode of confining sheep practised by some farmers in preference to the folding

system, viz., keeping them in house. As this method is quite applicable to the *cottager*, who should study minute economy, and who may find it more convenient to purchase a couple of sheep than a cow, and may have only food from his garden or patch of clover or tares for the former stock, we shall give a few particulars on the subject, having travelled lately for the purpose of examining a sheep establishment in Hampshire. The building is about 80 feet long and 10 feet wide (in the clear), open in front, and containing a boarded grating laid over a bricked and cemented sewer, which receives the droppings and urine of the sheep until it may be convenient to remove this valuable mass of manure. The breadth and space allowed for every pair of sheep (which have a rack and manger to which they are fastened) is 3 feet, so that about fifty sheep are accommodated in the shed. Broken-mouthed ewes and wethers are the principal stock. They were brought in about the 1st of July last, in pretty good condition, from sweet hill pasturage, and a short run on a field principally of white clover and trefoil, and it was expected that in four months they would be in perfect condition, weighing probably 30 lbs. a quarter. Tares or clover, with peas and oil-cake, will be their food until Swedes come in, and for the lots fattened in the winter and spring months, the following allowance of food may be deemed a sufficient average allowance, even for heavy sheep:—2½ lbs. of hay, 2 lbs. of oats, 1 lb. of peas, and 7 lbs. of turnips. There seems to be no reason why three successive lots might not be fattened annually under this management.

A cottager might perhaps find it as profitable to keep two or more ewes, to provide lambs for the very early markets, when he might expect from 30s. to 40s. each; and as Dorsetshire ewes have lambs occasionally twice in the year, and twins frequently, they are the best kind for this purpose. But the Southdowns, crossed with the Gloucestershire, are also to be recommended. After feeding the ewe highly with turnips, parsnips, corn and oil-cake, *when she has*

lambed, her condition will be easily advanced, until she is fattened off and sold. Or she may be held over, but we think less beneficially, for yielding other lambs, until she becomes broken-mouthed, and too old to be kept. A benevolent man does not like to devote his pets to the shambles until he cannot help it. The wool of the Dorsetshire race is of high quality, though not great in quantity.

The rich ammoniacal manure obtained by the foregoing methods is, to a *little farmer*, (such as are numerous in Ireland,) or to an English cottager with a field or good-sized garden, of exceeding value. But all things considered, if he can provide plenty of litter for the bedding of pigs, he ought to keep them in preference to sheep, if he must limit himself to keeping one or the other. If he does not intend to breed lambs for the Christmas markets, and wants to obtain a suitable stock for lambing at the natural period, he should purchase ewes in lamb during the month of October. No fixed rule can be laid down for the guidance of cottagers with land, as to the relative benefits to be obtained by keeping a cow, pigs, or sheep, for after all, the question resolves itself into one of locality and other circumstances. Where one animal is beneficial in a particular county, another may be beneficial in another; but the pig is almost indispensable to convert litter into rich manure, and to act as a *save-all* by consuming the offal which the other animals would reject.

CURE FOR THE SCOUR IN LAMBS.—Mr. R. Fisher, of Alcester Lodge, states, that he has found, by three years' experience, that the bathing of lambs is the most beneficial remedy for the scour. 'When the lambs are thus affected,' he says, 'I have them dipped for twelve mornings successively: a running stream is preferable to a pond. The lambs should be kept on old turf. My lambs have been affected from July to October. Sainfoin is the most beneficial food for them when suffering from this complaint. I have my lambs dipped at eight o'clock in the morning, and no pains are taken to dry them afterwards.'

SWINE.

PIGS constitute an important live stock, not only to the farmer, but also to the cottager, if he be possessed of a field or garden. If he do not keep a cow, a pig is necessary to him, in order to create manure; and if he do keep one, the rearing and fattening of pigs will still be very beneficial to him.

The wild boar, from which all our European varieties have sprung, was formerly a native of this country, and preserved in the royal forests for the chase. Of our domesticated varieties, we are disposed to give preference to the Berkshire breed, although the Hampshire, Suffolk, and some other improved kinds have also admirable qualities. The Berkshire combines all the proportions desirable in a pig, whether it be required for pork at an early age, or for bacon or light or heavy weight. This breed is easily kept in good condition, and has an early tendency to flesh: one of this sort is recorded to have measured, from the nose to the tail, 3 yards 8 inches, to have stood 4½ feet high, and to have weighed 1215 lbs. But size, even approximating to such an enormous standard, is not characteristic of the Berkshire kind, as of the Yorkshire and old Irish breed, so well known in a portion of the county of Kilkenny—the barony of Iverk. The gigantic hams and firkins which were prized formerly, are no longer in such demand as those of small or moderate size, such as the Berkshire supply, the average weight of those animals at twelve months old, being about eight score pounds.

The true Berkshire pig is black, or black and white, short-legged, full and round in the loins, rather fine in the hair, the ears small and erect, and the snout not lengthy. This description of animal forms a

striking contrast with the long-sided, convex-backed, lob-eared, long-legged, shambling brute which was common in many parts of Great Britain, and almost universal in Ireland thirty or forty years ago, and which still, without any improvement in form, is the only description of the pig throughout all Normandy, and, we believe, the greater part of France.

In giving preference, however, to the Berkshire breed, it is not to be understood that we consider them handsome in a *positive* sense, or perfect models of good breeding and propriety in their habits and manners. No dumpy animal, with its belly near the ground, with four short crutches for legs, hair by no means silky, a little curled tail, and small sunk eyes, peering into every hole and corner, and never looking upwards to the glorious firmament, can be called an absolute beauty; but *relatively* with other races of swine, the Berkshire are handsome. And as to their habits and manners, they have no little merit. For, considering the natural dispositions of the hog family, and the contemptuous manner in which they are spoken of and treated everywhere, (except in certain parts of Ireland and the highlands of Scotland, where pigs are privileged orders, and experience such respect as to be permitted, and even invited, to occupy the same room with their masters, by day and night, in consideration of their paying the house-rent, and supplying the means of purchasing salt, candles, and soap) the Berkshire race have unquestionable merit, and appear to respect the decencies of life. Their females have never been known to commit infanticide, as some other domesticated tribes of swine undoubtedly do, from what *we* consider a depraved taste, nor have either sex of this tribe been ever justly accused, or even suspected of that cannibal propensity which has led individuals of certain other tribes of the great hog family to seize upon the tender babe in the cradle, and devour it, 'marrow, bones, and all!' They (the Berkshire) are so docile and gentle, that a little boy or girl may drive them to and from the pasture

field or the common, without having their authority disputed. And when ranging about in the happy consciousness of liberty, though they may sometimes poke their noses where their interference is not desired, they do not perpetrate half the mischief to the turf which other classes of swine are prone to commit. They seem disposed to content themselves with the grass on the surface of the soil, without uprooting it in search of delicacies that may lie beneath, as do some of the long-snouted tribes which plough the earth up in furrows. They seem to make it a point of honour, too, to become fat as fast as possible, in return for the food they have received, in order that thus they may be in condition to pay 'the pound of flesh' which is 'in the bond' against them. They never fret at trifles, and thereby impede their digestion, and lose health and flesh. They never *sulk* and refuse their meals, nor complain of the quality nor of the scantiness of their food, like some of those ungrateful children, of certain parochial sties, who have fancied that they could have eaten a little more porridge, if it had been ladled into the parish manger for them. We do not indeed say that the Berkshire swine are singularly neat in their personal habits, nor ceremonious at their meals, nor free from the vice of gluttony, nor that they will not scramble and fight for the best bits, and exhibit their unseemly manifestations of self-indulgence, nor that they would be shocked at snoring aloud, even in the presence of royalty or nobility, if the inclination to fall asleep should seize them: but then it is to be remembered, that every individual of the hog species would do the same things. In short, their peculiarities decidedly tend to the *benefit* of mankind; and, after all, their failings, like many of our own, proceed entirely from the stomach. The capacious paunch of the pig, and its great powers of digestion, are what render it so beneficial to us; yet, though in a domesticated state, a pig will eat almost any sort of animal or vegetable food—raw or cooked, fresh or putrid—he is, when at

large, as naturalists inform us, the most delicate and discriminating of all quadrupeds. If free to select his vegetable food, he will reject a greater number of plants than the cow, the sheep, the horse, the ass, or the goat will refuse; so *nice* does he become when luxuries surround him, that in the orchards of peach-trees of North America, where the hog has delicious food, it is observed by Goldsmith, 'that it will reject the food that has lain but a few hours on the ground, and continue on the watch whole hours together, for a fresh wind-fall.'

We only know the hog under an unnatural character, in which he has few opportunities of exhibiting his natural sagacity. We are acquainted with him as a gluttonous, drowsy fellow, who would as soon wallow in the dirtiest puddle as bathe in a limpid stream, and who exhibits no great sensitiveness to passing occurrences, except when a storm is rising; then indeed he seeks his stye, in nervous agony. He appears very apprehensive of ferocious dogs, from woful experience of the sharpness of their teeth upon his ears, and evidently suffers terror when one of his companions cries either from fright or pain, as when undergoing the operation of being ringed; and therefore it appears incredible (even with Buffon's high authority on this point) that 'mice have been known to burrow on the back of these animals while fattening in the sty, whithout their seeming to perceive it.' The pig is too sagacious to be imposed upon in such a manner: an animal which is known (with careful education) to distinguish the letters of the alphabet better than some children can, and to back and stand game, cannot be so stupid as the pig is generally considered.

At the age of eight months, the female should be allowed to receive a visit from the boar.

In selecting the female for permanently breeding, care should be taken not only that she be well-proportioned and free from defects, but also that she have not fewer than ten dugs at the least, though on

the first and second occasions of her having a litter, it is very improbable that she will have ten young ones. A litter of twelve, or even more, is not uncommon, but ten is a more desirable number. The supernumeraries are weakly, and only reared by care, and with injury to the strength of the mother, and to the vigour of the other individuals of the litter.

The Creator has proved to us, by experience of his dealings, that animals domesticated by man for his use, are to be improved in their qualities, and, if designed for his sustenance, rendered more *prolific* by care and judicious management; just as it is with respect to plants which are multiplied, varied, and brought to perfection by skilful culture. Wheat, in a state of nature, would soon degenerate in kind and in productiveness; whereas, grains sown in a seedling bed, (we are taking an extreme case of economical and careful culture) and duly parted and transplanted, would cover a large space of ground, and produce in the most abundant manner. In both cases (animal and vegetable) the Almighty supplies us, as it were, with the rough material, on which we are to exercise our ingenuity and industry: and with respect to pigs, it is a curious fact, that in a wild or natural state, the sow has but one litter in the year; the domesticated has two, and may have five in two years. One sow has been known to produce 355 young ones in twenty litters. Mr. White, the naturalist, mentions an instance of a half-bred Chinese sow which had been kept until she was seventeen years old, when she had produced about 300 pigs, having had two litters in the year for ten years, and frequently double as many pigs as teats. The supernumeraries were destroyed. In such a very prolific breed, twelve teats may be considered among the qualifications of a sow. This breed is excellent if small porkers only are required; but it is too small for producing bacon, and altogether inferior to the Berkshire or Hampshire, and some other improved varieties. A boar (exhibited at the Highland Society Show in 1838) was the legit-

imate father of 1466 pigs, when he was only twenty months old.

During the period of pregnancy, the sow should be sufficiently fed, but not to excess. Experience has proved, that a sow, if fat during that time, is not prolific; but the opposite extreme—a favourite error with some ignorant people—that of stinting her in food, so that she remains meagre, is also to be avoided: a feeble progeny must be the result, if the mother be weak and unable to impart due nourishment to them.

The proper seasons for producing litters are March and August: the sow goes four months with young. The weaning should take effect seven or eight weeks (if the litter is to be reared) after she has farrowed. If the object be to have sucking pigs for roasting, they should not be kept more than four or five weeks with the sow; and as she will admit the boar the ninth day after farrowing, three litters in the year may easily be obtained from her. If the young pigs are to be reared, it is a great matter to have them born at the two seasons of the year which have been specified, in order that they may be weaned in temperate weather, and when there is an abundance of clover, vetches, mangold würtzel, lettuces, &c. At six weeks old, the young ones of both sexes, not designed for breeding, should be incapacitated from propagating their kind; and at eight weeks they should be weaned with skim-milk and butter-milk. Young pigs thrive better, for a short time after weaning, on sweet than on sour milk; but when they are pretty well grown, acidulated milk seems more beneficial and palateable to them than sweet milk: they devour grains, also, which have fermented, with more avidity than if fermentation had not taken effect. Coarse pollard, or the tailings of corn, or some bruised or ground beans, should be given to them after weaning, with boiled or steamed potatos, parsnips, or Swedish turnips, &c., with milk or kitchen wash. A great object ought to be, to feed pigs well from the commence-

meat; the food then *tells* considerably: the cost and difficulty of bringing up lost condition and size is great; and no animal thrives and attains full vigour and growth, if not well nourished in its youth. Store pigs, five or six months old, of the Berkshire, Hampshire, and some other thrifty kinds more especially, are very beneficially kept in growing condition on raw vegetables during the summer and autumn, if on a dairy farm—milk, in some form, being highly conducive to their healthy growth. Any one who examines the clean, ruddy state of the skin of pigs fed on milk, will estimate the value of such diet.

There should be a separate yard and sty for the weanlings; and for swine in all stages of growth and condition, a clean dry bed is indispensable. But if manure be (as it ought to be) a principal object to the cottager more especially, he will supply the green food to his store pigs with most benefit in their confined yard, in order that their manure shall be incorporated with it. Let him litter abundantly, and he may collect a surprising quantity of manure, even from a single pig.

The feeding troughs should be frequently washed; and if pigs are fed together, the troughs should be barred, so that each animal shall be limited to the space through which it introduces its head, otherwise the stronger will overpower, and perhaps drive away altogether from the food, the weaker of the party. The bars also prevent the ill-mannered brutes from putting their dirty feet into the mess, which otherwise they will generally do. The Berkshire pigs are fit to be killed at about five months old, for pork; at that age, they weigh from two-and-a-half to three score pounds, and are delicious for the table. If put up for the last two or three weeks, they usually get a little barley-meal or fine pollard, in addition to the ordinary food, and are not fed upon the watery diet that suits the nature of store pigs of the same age. Young pigs require a good deal of liberty, which un-

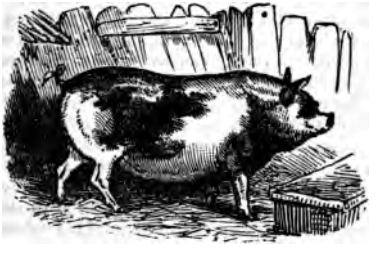
questionably promotes their growth and healthiness; but unless in the farm-yard, about the barn door, pigs in actual process of fattening should be confined altogether, so that they may eat and sleep alternately, without any of those disturbing influences which would tend to interrupt digestion.

A Berkshire pig should be from eighteen months to two years old to attain full weight—say from twelve to fifteen score pounds. It should have, in such case, some barley-meal mixed with that of peas, in order to render the flesh firm, although the potato-fed pigs of Ireland are firm in flesh, and bear salting remarkably well. The parsnip, however, is a preferable vegetable for them; and as it has been calculated that two-and-a-half poles of good parsnips are sufficient to fatten an ordinary pig, without any other food, the cottager may perceive how much it is in his power to supply himself with a flitch of bacon at small cost. On a barley and peas-meal dietary, it is estimated that a pig will increase from nine to ten pounds in weight, when in full fattening order, for every bushel of the mixed grain. Malted barley is peculiarly beneficial in fattening swine, and raw corn, or peas, quickly harden the flesh of those designed for bacon of superior quality. It has been ascertained that milk-fed pork is not equal to that fed on barley-meal; it looks as well, and if eaten fresh, is as well tasted; but it will not stand the test of curing, for in a few months it becomes rusted, whereas the other will keep good for a year. Again, the bacon fattened on beans is too hard, and boils out, instead of plumping in the pot (to use a vernacular phrase); and such is the prejudice against the latter sort of bacon among hog-killers, that they will not buy it except at a lower price.

At the commencement of the fattening process, pigs consume much more food than subsequently, and when quite fat, very little comparatively. A pig, therefore, for mere profit and economy, should be thoroughly fattened. A frequent washing and brush-

ing of the skin—though not usual—is to be strongly recommended, as tending to promote cleanliness and a healthy circulation. How, indeed, can a confined brute be in health, or in a state of bodily *comfort*, with a skin incrusted with scurf, and various defilements.

The operation of *shampooing* must be very agreeable to an animal which naturally takes pleasure in scratching itself, though it may ungraciously grumble when first subjected to the brush. Pigs, when sick, are like many men (we advisedly except women) very intractable; but fortunately, they will generally eat, even when very sick, therefore medicine may be administered in their food. Salts, sulphur, and antimony are the usual specifics for their disorders, which (if they do not result from blows, wounds, or accidents) arise from starvation or foul food, and dirty, damp beds. Measles are probably occasioned by an impure state of the blood, and strong beer (we have not yet tried Bass's pale ale with them) with peas-meal, has been prescribed as a tonic. If a pig refuses his food altogether, we know not what to do for his recovery. For imposthumes, after they have been opened and squeezed, a dressing of hog's-lard and salt is reckoned efficacious.



THE GOAT.

It is a curious fact, that although the sheep and the goat are to our views so distinct in formation, naturalists have found it difficult to point out precisely the differences in their physical conformation. One breed of goats in particular, (known in Wales) without horns, and white, is said to be distinguishable from the sheep only by its hairy fleece and indications of a beard. Some naturalists have distinguished goats and sheep from each other more by their tempers and dispositions, which are so manifestly opposite in some particulars, that our Saviour selected them as representatives of the good and the bad among mankind at the supposed day of judgment, when God shall "separate the one from the other, as a shepherd divideth his sheep from the goats: and he shall set the sheep at the right hand and the goats on the left."

There are many varieties of the wild goat, of which the kind found in the mountains of Abyssinia and Upper Egypt is supposed to be the wild goat mentioned in the books of Deuteronomy and Job. Some of the most highly prized varieties of the goat species, are those of Cashmere, in the North-west of India—where several thousand looms are constantly at work, weaving beautiful Cashmere shawls. The soft silky and curling qualities of the hair of the wild goat, now in various parts of the East, were equally remarkable in the days of Isaac. We find in Genesis xvii. that Isaac was so deceived by the softness of the hair of the goat which Rebecca had put on the hands and neck of Jacob, that the blind old man supposed it was the natural hair of the body of his eldest son.

In the catalogue of offerings for the tabernacle, we read, Exodus xxv. of "goat's hair" being presented

with "blue and purple, and scarlet and fine linen." Travellers inform us that the hair of the wild goat of the East equals silk in beauty, and curls like the hair of women: it is combed off, not shorn. It has long been a principal article of trade at Angora and Aleppo. Some domesticated goats have been brought from Asia to this country and to the south of France; but whatever chance they may have of preserving the original excellence of their hair in the latter country, there is little doubt that it would degenerate in the hilly parts of Great Britain and Ireland, where a rough weather-proof fleece is so suitable and necessary to the animal.

Whether the common domesticated goat be derived from the wild goat of the rocks mentioned in the Old Testament, or be itself an original variety, which is more probable, is not worth discussion here. The common breed of the British Islands is we believe as prolific and productive of milk as any other kind. Some of them attain a great size, and when of full age and with good management, will yield from one to three pints of milk daily during ten months of the year, and sometimes twin kids in the year. The flesh of the kid is delicious—provided the little innocent has not been stinted in its allowance of milk,—being less luscious and more delicate in flavour than that of the lamb as usually fattened for the market; but if it be a mere framework of bones, it is hardly worth roasting. Whatever may have been the quality of the "savoury venison" of the patriarchal days, the flesh of an old goat of modern times is certainly tough and unpalateable; but very old mutton is tough also. The flesh of a fat young female goat is decidedly good, and that of one somewhat advancing in years is quite eatable with proper preparation. Pennant has recorded what indeed any person who has entered into the houses of the peasantry of the Welsh Highlands knows to be a fact, that the haunches of the goat are frequently salted and dried, and supply the uses of bacon to the peasantry, who call it *cock yr wden*, or

hung venison. The meat of an emasculated male goat, six or seven years old, which is called *hyfr*, is reckoned the best, being generally very sweet and fat. This makes an excellent pasty, goes under the name of rock venison, and is little inferior to that of the deer.

But it is for its milk that the female goat is most prized. It has been called the poor man's cow, and it well deserves a higher degree of consideration than it usually receives from us. The peasantry of the south of France have had such experience of the worth of goats in their household and rural economy, that 25,000 goats are maintained in one district, that of *Mont d'Or*, near Lyons, where a celebrated cheese is made from their milk; more than 40,000 goats are kept in France, (principally in the southern departments), which number, compared with the number of pigs in the same kingdom, is as one to three.

Now pigs are decidedly more valuable and important to the cottager, (whose interests we have especially at heart), and if the question were, 'which shall he keep, pigs or goats?' our answer would be 'pigs;' —but this is not the question; such is not the alternative, for he can keep both—or at least he can keep a goat very easily though he may have no suitable food for a pig, and in every case, without depriving his pig of any portion of its proper food. Our high hills and commons, and furze brakes, and full-grown woods, would support an incalculably greater number of goats than are maintained even in the wildest and most profitless parts of Ireland and Scotland. The weeds that grow by the way-side and in the fields, and the waste of a garden, turnip or potato peelings, heath, or indifferent hay, will feed the goat, which readily eats any vegetable offered to it. The goat will eat herbs which even the sheep rejects, unless it be almost starving, and even feed on the common hemlock, which is poisonous to the cow. Wherever a green leaf is to be had, the goat may be supported; but in a cultivated country, that leaf must be plucked for the goat—the

goat must not be allowed to ramble and pull leaves for itself—else it will destroy shrubs and young trees at a fearful rate—and jump over any fences to cull whatever it may fancy. Except on wild land, then, goats are an intolerable nuisance if at large, and are therefore the subjects of very heavy fines under the trespass acts: but as no animal bears confinement better, and can be easily led by a string to proper feeding-places, or tethered on some common, or field, or brake, where it cannot do mischief, it may surely be kept without interfering in any degree with the claims, wants, or privileges of the pig.

A goat is a harmless and playful pet for children, and is often trained to draw them in a little cart. Even the stern soldier takes pleasure in the gambols and docility of the goat. Mr. Cobbett, who was a soldier in his earlier years, mentions in his "Cottage Economy," that when he was in America, many goats *belonged to his regiment*, and went about with it on ship-board and everywhere else, and that they were never fed—they picked up grass and leaves in summer, and lived in winter on whatever scraps were thrown out from the soldiers' huts. We may suppose, however, that they were pets with many kind-hearted men, who never let them suffer from serious hunger. There is at least one gallant regiment, we believe, which has the goat for its "badge," and is always accompanied by one or more of these companionable and spirited creatures, which are (in the male sex) so emblematical of courage, hardihood, and endurance.

Every cottager almost, now-a-days, drinks tea—or what is called tea—through frequently he cannot procure milk with it. What a luxury then to him and his little ones would be the milk of a goat or two! This milk, besides a kid (or perhaps twins) from each of them every year, would surely be a very beneficial recompense for the easily-procured food which would support them. The quality of goat's milk, too, is good. Invalids know that it is excellent: its light

ness on the stomach and nutritiveness make it suitable to them. The hair, skin, fat, and horns of the goat are useful for many purposes. The hair is convertible into wigs for judges and barristers; the skin is used for making gloves; the horns for knife-handles and snuff-boxes, and the suet for candles. If the skin be not stripped of the hair, it is a capital material for a working-man's winter coat or for a gentleman's shooting jacket. Vast numbers of men wear such coats in France, (as some of the Scotch wear deer-skin dresses handsomely prepared) as a certain protection against rain and cold. It is not worn by them, however, as the celebrated Brien O'Lynn wore his sheep-skin, viz., "with the woolly side in,"—for its refreshing coolness in summer—but with the hair *outwards*. It throws off water as the feathers of a duck would discharge it, and is a very durable garment also. Goat-skins also are much worn in the north of Scotland as a protection to carpets, in the same way that matting is used in England.

THE HORSE.

A HORSE perfectly suited to the various purposes of drawing a light carriage or cart on the road, and performing the small farmer's field work, and also for bearing a saddle and rider on occasions, is one of the most useful of its species; but requiring the combined qualifications of strength, activity, hardihood, gentleness, and sure-footedness, it—like an excellent servant-of-all-work of the human kind—is not very easily procurable, notwithstanding specious advertisements and testimonials of character, given in a very confident manner.

The person in search of a horse for all the foregoing purposes, ought not to calculate on obtaining one of unqualified excellence in all those departments of service: it would be unreasonable to expect that the stout animal which could easily draw a family party in a four-wheel carriage, or a tax cart through miry roads, should be able to trot as fast as a butcher's hack, which is generally kept moving at the rate of sixteen miles an hour. A light-bodied, slender-limbed, active fast-stepping horse, though suited to rapid movements, with saddle or harness, on a hasty mission, such as that of Obadiah on the back of a heavy-work horse, in search of Doctor Slop, could not effectually do the proper work of the draught horse, and if able to speak, might fairly say, 'this is no fit business for me.' The mere hunter, racer, charger, roadster, or draught horse for any special labour, is more easily found in a fair or horse sale repository, than the horse-of-all-work, because they have appropriate qualities of points, form, and temper, which are plainly distinguishable to any judge of horse flesh; whereas

the horse from which many varied services are expected, should possess qualifications more or less directly suited to the nature of such services.

It is an interesting fact, that God has permitted his creature man so to modify and alter the ordinary size, form, habits, and peculiarities of the important domestic brute animals, by a judicious selection of parents designed for propagating new generations, that in various instances the sort of animal best suited to the condition in which it is to be placed, or to the purpose for which it is specially wanted, is generated. A remarkable case of this nature is presented in the adaptation of the horse,—through the care and skilfulness of man exercised in its breeding and training—to the different purposes for which it is used. A few remarks will sufficiently illustrate this fact.

Eight centuries ago, the Normans introduced into England the powerful, active, and spirited war-horse of the knight, and the smooth gaited but inferior hackney of his esquire, and the ladies' ambling palfrey, so necessary to their convenience, when there were neither roads nor carriages for intercourse between the then lordly castles. Besides these three descriptions of horse, the humble pack horse was brought,—also an importation from France,—as a drudge for bearing back-loads; and in subsequent periods, the heavy Flemish draught horse, and the Arabian, were also brought and crossed with the Norman and the native breed, which possibly was of no mean character, for we read of "scythed chariots drawn by *fiery steeds*," in use among the ancient Britons, who opposed the Roman Legions. From those *types* of their respective kinds have arisen the excellent varieties of the horse for which England—so much in advance of France, which supplied the original types—is now so distinguished. Does a London brewer want a dray horse of enormous size and strength? he seeks one descended from Flemish origin, and increased in magnitude and power, by the

breeder's care, greatly beyond its original type. Are first-rate coach horses required? they are sought (or rather used to be, for they are almost extinct) among the Cleveland race, which descended from the Norman race. Is a superior horse wanted for the plough and the cart, or to take the farmer to market? he will find in the Suffolk punch, which was first produced by a cross between the Norman sire and the Suffolk cart mare, exactly what he wants. If he only wants a team of first-rate horses for farm labour, he seeks for the Clydesdale breed. And is a horse wanted for the different purposes defined at the commencement of this article? a purchaser cannot commit a great blunder if he succeed in obtaining one of the Galloway breed, or approaching as nearly as possible in all its points to the hardy, active, and stout animal known by that designation. "Galloway" is now used, however, as a term for any horse between the pony size and the hack; and in this point of view is sufficiently numerous. The true Galloway is somewhat larger than the Welsh horse, and is said to resemble the Spanish horse. Such of this breed as have been preserved in any degree of purity, are of a light bay or brown colour, with black legs, and are easily distinguished by the smallness of their head and neck, and the cleanness of their bone." Besides having legs of a black colour, it is important that the legs should be well formed and well set; as a general rule, a line drawn from the point of the toe—as the horse stands in proper attitude—to the point of the shoulder, should be quite vertical; the neck should neither be too short nor too long, and for safety as well as well as appearance, it should rise in a graceful curve. If speed only be the object, a low forepart is desirable, and a narrow, upright shoulder; but who that regards his own security would like to ride an animal so formed? and how badly does it look with a low, poking neck in harness. Yet, since a low and upright shoulder, thick at top, is the best for a dead pull, a person who wants a horse to work in the

plough and dung cart, and also to draw a light phaeton, and bear a rider, must seek for the right medium between a heavy and a light shoulder, clumsy and too thin limbs, a heavy paunch and a very light carcase; and as to other points, he must consider what on the whole will best answer his purposes. He will, under any circumstances be disposed—if he knows anything of a horse's points—to reject one that has long posterns, heavy flat hooves, flat ribs, bad hind quarters, and is deficient in breadth over the loins. With from £20 to £25 in his pocket, a man may buy the sort of middle-sized animal he requires, if he be a good judge of horse flesh, or have the assistance of an honest horse buyer.

HANDLING AND TRAINING.—The horse should be tenderly handled from the earliest age; familiarized to man, so that it will not contract the dangerous habits of biting and kicking at him, which are the consequences of bad education, and the natural instinctive efforts of self-defence against oppression.

But though a horse should be handled from an early age, it should not be worked with regularity or severely before its fourth year, though it may do light work a year sooner; and it should have a summer's run at grass (to do it justice) in the third year,—and the fourth also. Its muscular strength ought to be established before it is put to hard labour. Horses of any sort, prematurely *worked* (and they are not of full strength until the fifth year) become worn out before their time.

The work of a horse should be limited at first to carrying a light back-load, or drawing a lightly loaded cart; and the best way of training a horse to bear the resistance of weight, is to yoke it alongside of a trained one, and teach it to pull by degrees, slackening the traces when it feels the pull at the collar unpleasant, until it becomes accustomed to it.

After a little practice in this way, it will very soon bear the shafts of the cart, and disregard the rattling of the wheels, and learn to draw in single harness.

Patience and gentleness, on the part of the trainer, are indispensable to the docility of a young horse. A passionate man, who forces the collar over its head, or a snaffle or bit into its mouth, hurting its teeth and jaws, or who beats it on the head, or kicks it on the ribs when it is *afraid* to move forwards, or who flogs the tender and timid animal if it makes a false step, when its inexperienced limbs cannot move with ease and security on a rough road, ought to be dismissed without needless ceremony. The future intractability of the animal may be the consequence of the ignorance, stupidity, or ill temper of its first trainer, who, by his folly and stupidity, teaches it to resist his authority, (to which, under proper treatment, it would easily have been brought to submit) unless the poor thing is so heart-broken and stupefied by tyrannical abuse, as to lose its natural sagacity.

The docility of the horse, under judicious management, is wonderful; no animal, except the dog, is so capable of being rendered the companion of man. No other creature can be brought, by gentleness and patience, to face what it naturally fears extremely. For instance, the cavalry and artillery horses stand fire unflinchingly, and hear the thunders of the cannon without apparent dismay. So do the horses of the circus exhibit astonishing feats, which are the results of training.

Any horse, gently handled in its early years—patted playfully at proper times—fed from the hand with a bit of carrot, or with oats—may be taught to follow its master, or remain steadily by his side, though at liberty all the while to escape from him. In short, the horse, like the dog, may be taught to obey the voice and gesture of its master.

We had a pony a few years ago which, even in its most frolicksome moods, when loose in the stable-yard or paddock, would run up to the groom and follow him anywhere.

But, frequently, everything is done to crush the spirit of the sensitive horse. If it exhibit nervous

alarm at some new object, it is flogged or spurred, and—as the natural consequence—when it next sees the same object, it feels increased terror, because it has not only to contend with the instinctive apprehension which the object of alarm itself occasions, but also with the associated fear of whip or spur.

The methods of treatment which ignorant and intemperate men pursue, to conquer the nervous startings of a horse, are precisely those which are most likely to confirm them. Gentleness, then, with a young horse under training, and the use of language (which it soon sufficiently understands), instead of harshness of manner and the crack of a whip, should be invariably exercised. The sounds of gentleness and caressing kindness are quite intelligible to all sagacious domestic animals, and the horse is no exception to this fact. The voice of a gentle female, when she pats her horse with kindness, is always agreeable to it, because it associates with her voice tenderness and security from any manifestation of tyranny, or a desire to torment.

STABLE MANAGEMENT.—If there be a hay-rack in the stable, and it can be conveniently removed, get rid of it, and retain the manger; with some necessary rearrangement of it, a box-manger is sufficient for all feeding purposes. As the rack is so much above the horse's head, the poor animal is obliged to strain its neck in order to reach a mouthful of hay. In its natural state, at pasture, the horse pokes its head to the ground; but standing at the rack, the head is elevated in an unnatural position.

Every person who keeps horses knows that a great deal of hay is frequently left in the rack to save the trouble of renewing the allowance, and in livery stables hay is purposely packed tightly in the rack, in order that the horses may not pull it out without difficulty. The foul air of the stable, too, added to the breathing of horses on it, renders the hay so unpalatable to them, that less of it is consumed (as livery

keepers well know), than would be the case if it were supplied fresh, and shaken loosely into the rack.

The sufficiency of the box-manger alone will more fully appear when we shall have detailed the manner of feeding a horse kept for the purposes stated in the beginning.

We shall suppose that the horse-of-all-work is fed in winter on hay, oats, straw, pollard, bruised furze, potatos, and carrots. As the hay and straw ought to be cut into chaff, and mixed with the allowance of oats, the rack is useless for such food; it is inconvenient in summer for holding clover, vetches, or other green food. Away, then, with the rack, and substitute for it a box-manger. This, however, should be often washed, especially after holding boiled roots, or mashes of any kind; but cleanliness, in this instance, costs nothing. The stable, with a view to the economy of manure, is the fit place for a horse to rest in by day and night; if, however, a small loose yard can be penned off outside the stable-door, its health and the free action of its limbs will be improved, by having the liberty of moving about in it, and this, too, without loss of manure. Such a mode of management is very practicable in many instances.

It is pleasant to see a horse gambolling about in a pasture-field during the summer, and we fully admit that in numerous cases it is advantageous to turn it out to grass. The animal evidently enjoys its freedom, as it testifies by kicking up its heels, like a school-boy when let loose from the school-room. If there be a suitable pasture-field for the horse, we have only to remark, that it should not be turned on it until the growth of grasses is well advanced, for if these be nipped too early, the plants are injured, and retarded in their growth; and any horse being obliged to fall back upon dry food, feels a distaste for it, which would not be the case if it had not cropped the green blade.

Besides the loss of manure sustained by the grazing of a horse, there is another objection to its being

turned out on grass, namely, the danger of its being injured by a kick from some vicious horse, or the thrust of a cow's horn. Many horses limp home with broken limbs from a pasture field. The stable then, all circumstances considered, is the best place for any sort of horse.

Although the horse deserves every care, and is in some respects no less liable than his master to diseases, arising from over-feeding or insufficiency of food, bad water, bad ventilation, cold and unequal currents of air, and checked perspiration, it is frequently his fate to suffer from some or all of those fruitful sources of malady.

In a state of nature, the horse knows few or no ailments; pure water and grass and free air, keep him in high spirits,—but in the artificial state in which he is placed, when in stable, his treatment is often quite contrary to what his natural mode of life would prescribe. Perhaps he is confined in a low-ceiled close stable from which pure air is shut out, except when the door is opened, and a sudden rush of air is driven towards him: litter is left by day and night under him, while the hartshorn which arises from it is so powerful, as to make the eyes of any person who enters the stable smart and weep. Perhaps his body is swathed in heavy clothing, even in warm weather, with a girth so tight as to obstruct the free expansion of the stomach and lungs, to save the manual labour of shampooing, and produce a sleek skin at the expense of the animal's comfort. No wonder when a horse is led out naked in cold weather, and kept standing perhaps for many minutes at repeated intervals, that a heavy cough and all its train of consequences should succeed. However, we need not dwell on this point, as few men would keep a horse-of-all-work in body clothes—decidedly not, if field labours are to be required of it. To revert to close stabling, however, and fermenting litter,—common sense suggests that fresh air is specially necessary to the health and comfort of a horse. If any one doubts it, let

him visit crowded stables with confined air, and where heated litter is generally under a horse, and he will hear coughing and perceive weak eyes, and legs swelled and perhaps full of grease, which may be attributed to the inflaming effects of the fermenting manure and the ammoniacal litter. If motives of economy lead a person who wishes to create the largest possible quantity of manure, by means of straw laid for litter, let him consider that it may be "penny wise and pound foolish" to do so. Warm straw under a horse's feet constantly, must tend to excite inflammation in them, and so certain is this, that a very distinguished writer on this subject has recorded the result of a long experience in these words: "The constant use of litter heats, and makes the feet tender, and causes swelled legs: moreover, it renders the animal delicate. Swelled legs may frequently be reduced to their proper natural size by taking away the litter only. I have seen, by repeated experiments, legs swell and unswell, by leaving litter or taking it away, like mercury in a weather glass." Nor should litter, when forked out, be heaped up close to the door or window; its exhalations even outside, if close, must in some degree affect the air of the stable. A horse should be regularly wisped and brushed when in stable, even though he be employed in common labour; and if its legs be wet, they should be hand-rubbed and brushed until they become perfectly dry. The cracked heels, which are so common, frequently arise from neglect in this particular. A horse's heels, unprotected by much hair, and reeking with moisture, are quickly affected by its evaporation, caused by the warmth of the litter or of the stable, and rendered sore in consequence, just as frozen plants, when exposed to the sun's rays, become burned by the rapid escape of the warmth which they had contained. It is very wrong, therefore, to lead horses in winter to ponds or rivers, if they are to be stabled immediately afterwards, unless the heels and legs be rubbed quite dry, or are protected from this evaporation by such a

mass of hair as the true cart horse is supplied with by its Creator, and of which it should not be deprived. A very high-bred horse has so little hair over the heels, that he does not require the shears there, but horses of lower gradations,—such as are the subjects of this article—should have their heels trimmed, but not so as to leave them without a small pendant lock.

If the horse's coat be long and staring, or in other words, if the use of water too hard to dissolve soap, or any source of unhealthiness should cause imperfect or slow moulting of the hair, with fair grooming, it should be *clipped* cleanly off, provided the horse has not occasion to stand in chilling air at any work. If he be kept for a carriage or the saddle only, clipping will render even a sluggish and spiritless (because unhealthy) horse active and spirited; instead of suffering perhaps during an entire night from the cold and continuing wetness of skin from the exercise of the previous day, the clipped skin will become immediately dry and warm after rubbing, and no obstructed sweat will break out again. But a warm cloth should be thrown over the back and loins of the shorn horse, not only during his confinement in the stable, but whenever he should have occasion to stand still for any length of time when out of doors.

The food of the sort of animal under our particular observation now, may be calculated at about a third more of hay and oats than we shall assume, in the following paper, to be requisite for the sustenance of a small pony. The quantity of corn should be regulated by the proportion of fodder given, and the degree of work to be performed. If straw chaff be allowed without stint, and with a liberal allowance of corn, a very small portion indeed of hay (this should be sweet and well got up) will suffice.

A moderate supply of green food in spring is the most simple and natural physic for a horse which has been corn-fed during the winter; the constipation arising from a long dietary of oats and sapless hay is removed without the pains and gripings and exhaus-

tion which doses of aloes and other such purgatives occasion, and therefore is a necessary alterative, either preventive or remedial, of many disorders arising from a long use of stimulating food.

During the winter months, bran or boiled barley should be given to a horse fed on hard food at least twice a week, to keep the bowels in a perfectly free condition. And if such regimen be duly observed, the severe bleeding and physicing to which so many horses are so regularly subjected in spring and autumn, whether in a healthy state or otherwise, will rarely be resorted to from necessity. But in regulating the use of succulent food, such as meadow grass, clover and lucern, &c., (though the caution will apply to any sort of food,) care should be taken not to give more than small portions at a time, when a horse is wanted for any exertion soon afterwards. Let a man, after stuffing himself with a full dinner, get up and run, wrestle, or play at leap-frog or cricket, and he will experience something of the sensations of a horse put to smart work on a full stomach, and more particularly if it be loaded with food of a flatulent quality. Green food, given in moderation and at proper times, causes the coat of a horse to become silky, which is generally a proof of health.

In our younger days, horses—except those for field and common cart work— were too frequently limited exceedingly in drink. Hunters and carriage horses were rarely watered, except once a day; therefore with the thirst occasioned by dry food, they felt a desire to fill the stomach with water when taken out to drink: to prevent the bad consequences to their wind, from the obstruction in the free action of the lungs which the distension of the stomach always causes, the quantity of liquid was limited to a certain number of gulps, which the groom counted, and then the mouth of the still thirsting animal was pulled from the stream, and he was left during twenty-four hours under the torturing sensation of unsatisfied thirst. By the present rational practice, a horse may dip his lips frequently

in a pail of water during the day, and therefore he never drinks to hurtful excess. And one of the consequences of this humane treatment is, that asthmatic and broken-winded horses are much more rarely seen than when the opposite system was rigidly pursued. Soft water, such as that in which soap will readily break, is the best for horses. Hard water, or any that is loaded with certain mineral substances, is apt to cause, besides a staring coat, many serious disorders. If hard pump water only can be procured, it should be raised some hours and kept in a warm atmosphere before it is given to the horse. In the other extreme, foul pond water, even without the addition of the liquids from the stable yard which may flow in it, is unwholesome. A horse, if not too warm, may at any time, when in exercise, be allowed to drink a little water; it cools and refreshes, without doing any injury.

The practice in France is to give horses, when baiting on a journey, corn first, and then water; and our practice is the contrary. Diluting the food with drink in some degree seems natural, and it can matter little whether the needful portion be given before, after, or during the feeding; but it is important to avoid an over-quantity of corn and water at the same time. Horses have been known to die from the bursting of the stomach, even with moderate exercise, when too much filled with *barley* and water. Such grain, in a wet state, swells and would distend the coats of the stomach to bursting; for this reason, peas are a particularly dangerous food for horses, from their tendency to expand, and the flatulence which they occasion; and beans, being a very stimulating food, should only be given to very hard-worked horses, and in small quantities.

To prevent a greedy horse from swallowing his corn without chewing it, cut straw or hay (chaff) should always be mixed with it. The bruising of corn in a mill, though it has many advocates on the plea of economy, has also many opponents, who maintain

that though the horse does not in such case void from his stomach undigested grains, the action of his teeth and jaws in masticating what he does chew, causes it by the mixture of saliva, to become chyle or true food in the stomach, which otherwise it would not become, in the same degree.

If a horse on a journey cannot be allowed much time for consuming a small feed of oats and a little hay, or is fatigued and will not eat oats, the best restorative food he can get is oatmeal, slightly wetted with water;—if watered to the consistence of porridge or gruel, it becomes laxative, and therefore unfit for the strengthening of the horse. Some horses wont eat it, or dry bran, and it is difficult to manage such fastidious and tender ones.

In Germany, coarse black rye bread is constantly given, on journeys, to horses; and as the stomach of a horse is very small, in proportion to his body, a little piece of solid and nutritive food, well prepared and often given, (for his digestion is quick,) is really better for him on a journey than a greater bulk of ordinary food, which may impede the progress of his breathing. A horse brought into stable from grass should not be fed too suddenly with corn, or reduced all at once to a hard diet; he should be gradually relieved by moderate work or exercise—producing perspiration from the gross humours engendered in his body while at pasture, and brought by degrees to the hard winter diet. Cooked food occasionally is wholesome and economical for our horse-of-all-work. Into the various diseases and ailments of the horse we shall not enter.

THE PONY.

MANY persons, besides those who keep a pony for drawing a little gig or phæton, have need of one to draw a common cart, to execute the light drill work of a market garden, or for jobbing.

The great improvements in the construction of all wheel carriages, and of roads—but still more so, perhaps, the legal exemption from taxes of horses not exceeding twelve hands in height—have led to the very extended increase, in England, of dwarf ponies. These little creatures, from the rate of speed frequently required of them, and the heavy loads imposed on them, are over-driven and over-weighted. Some of them, though only formed for active movements, and for drawing very light weights, are often loaded as if they were strong, full-sized horses. While I have been writing thus far, a diminutive pony has passed my window, drawing three men and two women, at a furious rate; and a short time before, two middle-sized dogs rushed along the same road, panting from the fatigue of drawing a large man and a woman in a cart. Both, especially the latter of these instances, are unquestionably acts of wilful oppression and cruelty. Yet this case may plead the implied sanction of an act of parliament—the friends of humanity in the House of Commons having there failed in their efforts to save the dog from such cruelty, except within a prescribed distance of the streets of the metropolis.

The other abuse is the result of a well-intended act of parliament, which has exempted from tax the owner of a small pony, when it was not anticipated that motives of parsimony, or too rigid economy, would lead

to the substitution of a small pony for a horse in many very severe labours, utterly disproportioned to its powers.

The person in search of a pony to draw a moderate load, and for slow work, may find some of the following remarks useful to him :—

First, as to the form of a pony designed for labour and slow draught ;—The legs and posterns should be short, the ribs and quarters round and full, the chest broad and open, and the couples short.

As the breadth of the body is not, like its height, taxable by the statute, the buyer should avail himself of the legal omission on this point, and take all the *latitude* allowed ; if the limbs be strong in proportion, the breadth and weight of the body cannot be too great. If, on the contrary, the pony be wanted for activity and easy labour, its symmetrical proportions must be attended to, which are pretty nearly those, in miniature, of a handsome well-bred horse ; but, in all cases, a compact, well-limbed pony is the most serviceable sort,—a loosely-made, long-legged, cat-hammed one is, for any purpose, a perfect abomination.

We have now to consider a matter of very practical moment, viz., The quantity and cost (at the present rates) of food necessary for a pony twelve hands high.

Supposing it to be fed entirely on hay and oats—I think that two-thirds of the Government allowance for cavalry horses is sufficient for a pony of the above size. That allowance is, I believe, 12 lbs. of hay, 12 lbs. of oats, and 6 lbs. of straw, for twenty-four hours. The cavalry horses generally are in excellent condition on this allowance, and I may infer, that 8 lbs. of oats and 8 lbs. of hay are sufficient for the stomach of a little pony. The regularity of feeding hours, and the frequency of wisping and brushing them, has no doubt a considerable influence on the condition of cavalry horses, but a pony may be at least as regularly and as well groomed, and in numerous cases as regularly fed.

Supposing a pony, then, to consume 8 lbs. of oats

per day, at the rate of 18s. per quarter—which is the current price—and 8 lbs. of hay per day, at £3 per ton, the amount would stand thus—

	£	s.	d.
Oats, 9 qrs. 1 bushel (of 40 lbs.) at 18s. per quarter	8	4	8
Hay, 26 cwt. at 3s. per cwt.	3	18	0
Add for shoeing	1	10	0
	£13	12	8

Straw, for litter, will generally be provided in exchange for the manure which it produces.

But a change of food is desirable, and in some instances, decidedly economical; for instance, during three winter months, furze shoots may occasionally be substituted for hay, and this would effect some saving.

Again, if straw (cut into chaff) be given instead of hay, a reduction in the above estimate will be effected; but though good straw is better than bad hay, it is to be remembered that no straw is equal to good hay. If carrots, Swedish turnips, &c., be procurable at the prices at which they are now valued by farmers, and used partly instead of oats and hay, there may be another reduction obtained in the first estimate. If lucern, vetches, clover, or even ordinary soiling, be purchased, (or grown by the owner of the pony) at the average rate of 1s. per pole, there will be a very considerable saving obtained during four months of the year. Calculating that a pole of such green food would be sufficient for the keep of a pony during six days, the cost would be 2d. a day, or about 17s. for one-third of the year—oats being unnecessary during that period. If, then, 17s. be entered for four months, instead of the sum estimated for hay and oats during that time, the actual cost of food might be reduced to £10, without taking into consideration the still further reductions that may be effected by substituting furze and straw for hay.

If a jobber have the privilege of grazing a pony on a common, he will act judiciously in not availing himself of it in the early spring, or in winter: the sour weak food which commons in general yield, renders any kind of horse unfit for work.

There is, however, an advantage which the poor man may sometimes derive from the commons in winter for his pony. He may shear the young shoots of furze growing there; and these, when pounded in a trough, become an excellent substitute for hay or chaff—*if* oats be given also—until the blossoming season, when furze becomes unfit food.

THE ASS.

WHAT an ass that fellow is! With the word ass are associated the ideas of extreme stupidity, folly, and obstinacy; yet these qualities, however justly they may apply to many two-legged creatures, are very unfairly attributed to that four-legged species of the horse genus distinguished by the learned as *equus asinus*, or horse ass.

This despised and ill-used drudge was first introduced into our part of the world from Asia, where, in its state of freedom, it is by no means an insignificant animal. We read in the book of Job (xxxix. 7.) of the ass as disregarding "the crying of the driver;" and as to their swiftness in the east, in their wild state, we are informed by travellers, that the best horses cannot equal them in speed; indeed, their Hebrew name expresses this quality. A prophet indicates the acuteness of their perceptions where he describes them as "snuffing the wind like dragons."* We know from Scripture history that men of rank used to ride upon asses. The thirty sons of Jair, one of the judges of Israel, rode upon thirty ass colts when they went to administer justice in the cities over which they judicially presided; and another judge, we are told, sent out forty sons and thirty nephews on "three score and ten ass colts," as it was not until the time of the warlike kings of Israel that chariots and horses superseded the use of the ass. The fact that our Saviour is represented by the prophet Zechariah as *lowly*, riding on an ass, and that his doing so was indicative of his humility, is not inconsistent with what we know to have been the custom with respect to the

* Jeremiah xiv.

highest dignitaries of older periods of the Jewish church before the use of horses was general. In our Saviour's time, the ass had become the poor man's beast. What would be thought now if our judges or even our lawyer's clerks, were to travel on circuit, from town to town, mounted on asses? However, if we had never seen horses, we should probably think asses beautiful and excellent; but the superior beauty, strength, and fleetness of the horse and of the mule (which is also superior to the ass) have rendered the ass unfashionable. "The comparison degrades him, he is considered, not in himself, but relating to the horse; we forget that he is an ass, that he has all the qualities of his nature, all the gifts annexed to his species, and think only on the figure and qualities of the horse which are wanting in him, and which it would be improper for him to have."

The breed of asses common in the east, has always been larger and stronger than the degenerate kind which we possess. There is no reason to doubt that the account given of them by Dr. Russell, a physician, residing at Aleppo, in the last century, is correct at the present day:—"Those intended for the saddle bear a high price; they are tall, delicately-limbed, go swiftly in an easy pace or gallop, and are very sure-footed: they are fed and dressed with the same care as horses. The bridles are ornamented with fringe and cornices, or small spells, and the saddle, which is broad and easy, is covered with a fine carpet." Another writer says of the Arabian ass, "white asses are esteemed for their rarity, and only obtainable by persons of wealth and distinction, as we conjecture from this passage of Zechariah: 'Speak, ye that ride on white asses, ye that sit in judgment.'" White asses are still very rare; we have lately seen a very beautiful one, and do not recollect having seen one of the same kind before.

The Americans have taken great pains to propagate a fine breed of asses. Captain Marryat saw some splendid asses in Kentucky, of which some were

fifteen and sixteen hands high. These had been obtained by crossing the Spanish breed with the Maltese. The late Captain Marryatt has related as facts that a celebrated jack, called Warrior, was sold in Kentucky for £1000; that £600 was asked for a two-year-old jack, and £250 refused for a yearling female. It is no wonder, then, that this distinguished author should have informed us that "never in his life before had he felt so much respect for donkeys."

Why should not the donkey be as much an object of consideration in our United Kingdom as in Kentucky? whatever is worth having, is worth having good. Horses, cattle, sheep, swine, and even poultry, have been brought, in this country, to a great degree of perfection, by careful crossing and judicious management: our original cow was a little animal, yet in some varieties of the tribe, she is gigantic in her proportions, and excellent in all her qualities; our breeds of the hog tribe have been rendered beautiful, by contrast with the frightful, ill-shaped swine of Belgium and France, which shows what may be accomplished in the improvement of any domestic animals by human care. Though the ass, in our moist and gloomy climate, might never equal in vivacity and intelligence its foreign relatives of more sunny climates, it might be wonderfully improved both in size and strength. The asses first imported from Spain into Kentucky did not exceed fourteen hands in height, and yet their progeny became much taller.

But, it may be asked, is an ass worth all this care and consideration? is not a pony a much more desirable and useful animal? is it not swifter, stronger, more docile, better calculated for cottage farm or garden labour than the sluggish donkey? True—to those who can afford to pay the higher price of a pony, and support the greater expense of its keep, this animal is by far the more desirable of the two in many cases, but under certain circumstances, the donkey is preferable. Besides that, it is less liable

to sickness and is much longer lived, under ordinary treatment, than the pony, and that it may be purchased for the merest trifle—for what a poor man may afford without difficulty. The former is more useful for many purposes than the latter; for instance, a donkey is more suitable for carrying children or invalids on its back, as it neither stumbles nor is disposed to run away. Ponies could not endure the daily labour and scanty fare to which donkeys are subjected, whether in drawing the poor man's load from place to place, or bearing on its back heavy ladies, or panniers full of children, in their summer excursions at spas and bathing places. Their patient endurance under many privations, while it renders them objects of compassion, shows their capability of usefulness.

A donkey of our acquaintance has been drawing from a village to a market town, three miles distant, every day and back again (Sundays excepted) during many years, a large, covered market-cart. This animal, now about twenty years old, is left standing in the streets of the town to which he daily goes, without even the protection of an old sack thrown over its loins, when a storm of rain or hail is beating pitilessly upon it—and as to anything in the way of *luncheon*—I believe it is of very easy digestion indeed. A benevolent lady allows the owner of this hard-worked animal to turn it into her straw yard on its return home in the evening, and its crib is not, I believe, without hay too, supplied by her; but as to oats, carrots, potatos, or any of these unusual dainties which an ass is not without the capability of enjoying, they are never bestowed on this particular ass as a reward for his labour I doubt if even a thistle, which any ass would consider a luxury, is ever culled for this ass by the boy who shares his daily companionship. Yet this long-eared drudge, who, while under the cart, cannot be persuaded to move, except at a solemn and care-worn pace, is no sooner freed from the vehicle, and mounted by the boy, than he

kicks up his heels—after an uncouth fashion of his own—and canters away briskly to the farm-yard, where his dinner and supper (in one meal) await him. Perhaps, however, another motive than that of hunger tends to make him move so quickly: a crowd of urchins is generally at his heels, pursuing him and his rider with shouts, in the hope that the latter may be flung, in which they are always disappointed. Now, this is the sort of treatment which nine asses out of ten receive: boys, who are naturally inclined to cruelty and the exercise of a tyrannical temper over the brutes formed for our use —but not to be abused by us—take especial pleasure in tormenting the patient, but yet intelligent and lively ass, who, if not heart-broken by oppression, quickly learns tricks in his own defence. I once possessed an excellent donkey of great sagacity. He quietly drew a cart under the guidance of any boy, but no one could ride him except one lad, who had taught him to throw every other individual who might mount him for sport or experiment. He would quietly let any one get on his back, but the person was no sooner seated, than he was tumbled over the head of the donkey, who had the trick of putting his nose on the ground and lifting up his hind part, so that it was impossible to avoid being thrown; yet he never played this trick upon his teacher, shewing in this a good deal of intelligence. The ass possesses much instinct and sagacity. If at liberty to show the acuteness of his senses, he seeks shelter at the approach of rain; he shakes, waves his ears, and by a restlessness of body, shows that a change in the atmosphere of an unpleasant nature to his feelings is occurring,—and the old adage—

> "'Tis time to cock your hay or corn
> When the old donkey blows his horn"—

Is no doubt founded on experience. Has a donkey no sensibilities? does he not cringe when he sees the

cudgel raised to strike him? though knowing the uselessness of resistance, he neither kicks nor bites. He is naturally docile and playful in his temper with those who treat him kindly, though from bad management he is apparently obstinate. His training is different from that of other beasts of burden; instead of being taught gradually to carry a weight on his back, or draw a cart, he is started off at once with a boy on his back, armed with a cudgel, who tugs at the bridle—rudely forced between the jaws of the little animal—as if the creature knew the use of it instinctively, or forced between the shafts of a car, which he is expected to draw as kindly as if he were used to it: if he does not move on, he is cudgelled for not knowing what to do, under circumstances quite new to him. Instead of blows on the neck, or head, or ears which are particularly sensitive, he sometimes receives kicks on his ribs, and it is needless to say that either system of punishment is as injudicious as it is cruel: the ass is rendered obstinate by it. If men and boys would consider how differently treated they had been in their days of inexperience, they would not be so unjust and unreasonable as to expect that a donkey should, in training, be treated so differently from a horse—merely because he has had the misfortune to be born a donkey. They, like true bullies, take liberties with this unresisting animal which they would not, under similar circumstances, venture to take with a horse or mule. The donkey really deserves to be a pet, as he sometimes is with benevolent persons.

I knew a very old French gentleman who had been one of the survivors of the army which accompanied Napoleon to Russia. Instead of in his old age keeping a prancing charger, he chose to ride a donkey. This aged colonel—such was his rank—almost turned his sword into a pruning hook. I sometimes watched him in his garden as he pruned his vines and other wall-fruit trees. Now and then he would go up to a sleek, happy-looking donkey—for which there was a nice

paddock and a stable, of which the animal had the free range—and pat it on the back, in a manner which showed that there was a delightful understanding between them. The old gentleman would often exchange his white cotton night cap and garden jacket for a hat and coat, and ride Neddy—I am wrong, Napoleon we called him—to a farm which he possessed about three miles distant. That was a happy donkey, for though he had frequently to carry a heavy man a few miles, he had nothing else to do—and was always well-fed and groomed. It was, indeed, pleasant to see Napoleon, when his master had dismounted and taken off the saddle, roll himself on the gravelled yard, not as if he was weary or wanted to relieve himself from any irritation of skin, or meant to reproach his master for not using curry-comb and brush, but simply from excess of happiness. A few practical remarks will be sufficient as to the economy of keeping an ass under circumstances which render a pony less desirable.

The ass breeds at two years old, and if care be taken to procure a large description of male and female, there is no good reason why any person, having a few acres of land, might not annually breed some asses, which would sell for a price much above the ordinary one of the diminutive creature we usually see. The cottage farmer can always hire out a she-ass, when giving milk, to some invalid, who would willingly pay for the milk which is so highly prized for its sanitary qualities. It is hard to estimate correctly the expense of feeding an ass; but doubtless much less than half the cost of keeping a pony—on the economical system suggested in the chapter on pony-keeping—would be sufficient. Pounded furze, before the blossoms appear, are excellent for donkeys, and a large carrot or two daily would be one of its greatest luxuries. But in this respect, any of the ordinary garden roots are excellent; fresh chopped straw would answer as fodder, if hay were scarce, except for an ass yielding milk, when every kind of succu-

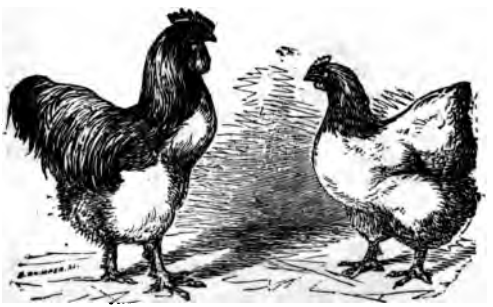
sent food should be given, as it is very unwise and cruel not to feed an animal while giving milk and rearing a young one on such food as tends to the secretion of milk, and to the maintenance of her bodily strength. Thistles and various weeds are always agreeable to the ass, and can be obtained for the trouble of collecting them. No animal is more cleanly in its habits than the ass; it must have clear water, which it sips very delicately, never putting the nose, like a thirsty horse, into the water, though the reason of this peculiarity is not very rationally accounted for by the supposition that it is afraid of the *shadow* of its long ears in the water.

It is to be wished that a large race of donkeys were bred, instead of the small ones which may be purchased for twenty or thirty shillings. In such case, the owners would probably treat them better than they do at present. A hawker or pedlar has not a sufficiently strong motive of self-interest for taking care of an animal which he knows he can replace for a very trifling sum. If a donkey were worth £3 or £4, instead of £1 or £2 at the utmost, we should have expectations of its being better fed, —and less abused in every way, and of living out its natural period of thirty years—whether in the labours of a cottage farm, the service of a pedlar or hawker, or in any other sort of constant labour. If our wishes could avail, the detestable cruelty of using dogs as beasts of draught would be abolished altogether. The donkey would be a far more suitable animal for the class of people who now use dogs for carriages, and on its journeys by the way sides it might always be fed, without expense to its owner, during a great portion of the year. This is not the case with respect to dogs, which cannot live on grass and weeds and the young shoots of trees and bushes.

DOMESTIC FOWLS.

We shall proceed first to give a description of the several kinds of fowls common in England, and afterwards the proper methods of treatment, to ensure the greatest advantage and profit.

1. The Cochin China Fowl.—This fowl possesses undoubted merits which will probably continue it in high favour with most poultry keepers long after the present mania for it has subsided. It is very hardy, bears confinement and bleak and unfavourable situations, attains early maturity and great size, lays abundantly and is a good sitter and nurse, and finally, if not more than five or six months old, is quite equal to other fowls for the table. It is very little influenced by the season in laying—but begins when about five months old—summer or winter. Many of the Cochin fowls offered for sale are not pure breeds, but contain a mixture of the Malay or Dorking. "In buying them," says Baily, "avoid long tails, clean legs, fifth toes, and double combs. Above all, take care that the cock has not, nor ever has had, sickle feathers." Another recommendation of the breed is their inability to fly; a fence four feet high is sufficient to keep them from straying.

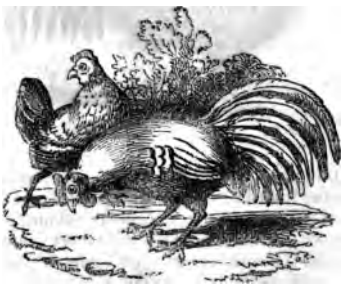


2. THE MALAY FOWL.—This was formerly the largest fowl bred in this country, but is now excelled by the Cochin species; its general colour is yellow, intermixed with dark brown; it is very long legged, and on that account is not well adapted for sitting, neither is it desirable to be kept for its flesh, which is coarse and of a dark colour. The eggs, however, are nutritious, and are of larger size than those of any other hens.

3. THE SPANISH FOWL is the next in size; it is

also long legged, therefore the same objection applies to this as to the Malay. It is common in the neighbourhood of London. The plumage and legs are entirely black, and the combs very large and red. The flesh is white and good, and the eggs nearly as large as those of the Malay hens.

4. The Dorking Fowl is so called from the town



of Dorking in Surrey, where they can be seen in the greatest abundance, and are said to have been first brought thither by the Romans. This fowl is the fourth in size of British poultry, and has a finely shaped body and small legs. Its colour is generally either white or speckled, and it may be distinguished by having five claws on each foot; one of which, however, is usually imperfect. The colour of the flesh is not so white as that of some of the common kinds, but inclines to cream colour; it is, however, of fine flavour. The eggs are large, and this fowl is an abundant layer.

5. The Poland Fowl.—Of this there are two varieties, the one black, with a top knot of white feathers; the other gold coloured and spotted, with a dark feathered crest. The plumage is not so abundant as that of most others; their legs are short, their bodies are plump, and next to the Game Fowl,

they are considered to be the most beautiful in appearance. The flesh resembles that of the Dorking, being rich and juicy. These fowls have the least desire of any to sit, and from the greater number of eggs which they lay, they are the most valuable, and have been called EVERY DAY HENS, or EVERLASTING LAYERS. Their eggs are scarcely so large as those of common hens, but from the great quantity they produce, and their little tendency to sit, they are the most profitable of all the varieties.

6. THE BOLTON GREY.—This fowl may perhaps be

esteemed next to the Poland; it is very little known in the south of England, and derives its name from the town of Bolton, in Lancashire, in which county it appears to be most reared. It is thus described by the Rev. Mr. Ashworth, "Small-sized, short in the leg, plump in the make. The colour of the genuine kind invariably pure white in the whole loppel of the neck; the body white, thickly spotted with bright black, sometimes running into a grizzle, with one or more black bars at the extremity of the tail; they are esteemed as very constant layers, though their colour would mark them as a good table fowl."

7. THE GAME FOWL.—This is the most beautiful

and rich in plumage of any of the gallinaceous group, and in gracefulness of figure excels them all; the flesh is superior in whiteness and flavour to that of any other; the eggs are finely formed and delicate in flavour, but rather smaller than those of ordinary fowls. This breed, however, cannot be reared to any profit, on account of the natural propensity of the birds to fight, which manifesting itself at a very early period, renders it a matter of extreme difficulty to bring up the young brood.

8. THE BANTAM FOWL is a well known small breed, of which there are several varieties, some are covered with feathers down their legs, while others are as smooth-legged as the common kind. They may be made useful in hatching the eggs of partridges, as they are good nurses, and good layers. They may be used for the table instead of partridges or young chickens: the flesh and the eggs are very delicate in flavour. Our cut represents one of the smooth-legged partridge-spotted breeds.

We have here enumerated [illegible] principal choice varieties of fowls which are bred in this country, but besides these, there are many other kinds, which have been produced by the continual crossing of the breeds; some sorts are peculiar to certain localities, which appear to be favourable to them; and the common FARM YARD FOWL possesses the diversified characteristics of all those we have described; some are good layers, others good sitters,—these valuable for their flesh, those for their eggs; and therefore persons who are inexperienced in such matters, and wish to avail themselves of the advantage of keeping fowls, must trust to the judgment and honesty of those from whom they purchase, as to the required qualities.

ON THE CHOICE OF STOCK.—No fixed rule can be adopted in the selection of ordinary fowls, experience showing that it is impossible to infer which individuals among a number of young hens will be good layers or good sitters. No dependence can be placed in the

colour or form of the farm-yard fowl by which to judge of these qualities. We may, however, say, that those which more nearly resemble in appearance any of the select varieties we have enumerated, will have similar characteristics. Thus the long-legged kinds are not very useful as sitters, as they do not cover the eggs so well as the other kinds, they are besides apt to trample and break them. But it does not follow, that because the form of the hen precludes her sitting well, she has no desire to do so; for we as often find the propensity as strong in the long-legged as among the short-legged breeds.

The following general directions, from Main's work on poultry may be found useful: "The races of hens which should be bred in preference to others, are those which yield eggs in the greatest abundance, and whose flesh is the most delicate; these two advantages, and especially the first, are blended in the common hens. In selecting them, they must be chosen of a middling size, of a black or brown colour, a robust constitution, having a large head, sharp eyes, the comb pendent, the feet bluish; those with large spurs, which scratch, which crow, and call in the same manner as cocks, must be rejected." Remember the popular distich,

> "A whistling woman and a crowing hen,
> The worst plagues ever sent to men."

A friend who has considerable knowledge on this subject, has furnished us with his views as to the sort of hens most suitable to be chosen. "In my own experience," he says, "I have found the following characteristics worthy of being kept in view, viz., a good middle size, with white or bluish legs of proportionate length; the comb what is called 'double,' regularly formed, and well filled up; the head small, the eyes black and lively, the tail not very large or much expanded, the feathers thickly set, 'close,' and smooth, —the colour light or pale ground, thickly studded with well-defined dark-coloured spots and bars. A

hen, with all or most of these marks, will mostly be found an excellent layer, and may be termed both good and good-looking.

"The fowls with large round top-knots, showing a descent from, or at least a mixture of the 'Poland,' are generally very good layers."

Mowbray says, that "the green linnet is an excellent model of form for the domestic fowl, and the true Dorking breed approaches the nearest to such a model."

After all that may be said, observation and experience alone will determine the value of the hen; and the best way to arrive at any definite conclusion, will be to keep memorandums of everything connected with the fowls, as to their form, colour, age, produce, &c. Such a plan, carefully followed, would no doubt lead to very satisfactory results.

It is of no less importance to be careful in the choice of the cock as of the hen; he should be of moderate size, carry his head high, have a lively appearance, a clear voice, a fine red glossy comb and wattles, a broad well-expanded breast, and be strong in the wing, and of *dark* plumage. The legs should be thick, the claws sharp, the bill short, and he must be quick and energetic in all his actions.

When the cock takes a violent dislike to one or more particular hens, the obnoxious individuals must be removed, otherwise they will be perpetually worried and harassed, and obliged to mope about in corners, and will always be subject to be torn or maimed by the cock; we have even seen a fine hen struck dead in an instant by one blow from her cruel and capricious master.

When a young cock is substituted for an old one, the hens sometimes object to the new comer. This probably arises from his dulness; and the way of reconciling them is to feed the cock upon the most nourishing and stimulating food, to keep him warm, suffering him only to be abroad during sunshine, never when the weather is wet or cold; by these

means the hens will become gradually accustomed to, and pleased with their new partner.

There is a diversity of opinion as to the number of hens to be allowed to one cock. Mowbray says from four to six, the latter being the extreme number, with the view of making the utmost advantage. Ten, and even twelve hens have been formerly allowed to one cock, but the produce of eggs and chickens under such an arrangement will seldom equal that to be obtained from the smaller number of hens. He says also, "the good housewives of France made themselves very merry with my practice of restricting the cock to so few hens, their allowance being twenty or even twenty-five. What difference may subsist between the soil or animals of England and France, I am not qualified to determine, I can only assure the reader, that my rule is the result of long and actual experience."

Other writers variously state the number of hens most desirable, varying from five to twenty-five. But the object in view must always be regarded; for if the eggs be intended for hatching, one cock to six or seven hens will be necessary in order to ensure a strong and healthy brood, while twenty hens may be allowed when chickens are not required. It is not even necessary to have a cock at all, when only eggs are wanted. When no male is kept, the eggs produced are called clear eggs, and though they are said to be scarcely so wholesome and nourishing as others, yet they have the great advantage of keeping better. A hen kept closely confined in a cage, laid regularly every other day, from March to October, during two years.

General Management, Situation, Poultry Yard, &c.—To ensure success, and to realise profit in the breeding of fowls, it is absolutely necessary that the nature of the soil on which they are kept be of a thoroughly dry character. Damp clayey soils are highly injurious, as in such situations the fowls will be affected with asthma, diarrhœa, and other diseases, which produce great mortality among them. On the

other hand, in a dry and warm situation, they will flourish with scarcely any trouble or attention.

Observe the difference between fowls kept in close damp streets in London and other large towns, and those which have the advantages of light, air, and sunshine.

The same conditions we choose for ourselves, are those best adapted for fowls, viz.,—air, light, warmth and dryness; with all these circumstances, there need be no fear of failure. To ensure these, let the yard in which the fowls are kept be well drained and gravelled, so that there may be no collections of refuse matters, or stagnant water to produce disease, but that it may soon become dry after rain.

If possible, the poultry-houses should have a southern aspect; any out-house or shed may be rendered suitable, especially if adjoining to the dwelling-house, where the warmth from the fires at the back of the wall may serve to warm the building. This will be found very advantageous to the fowls, for as they are originally natives of warm climates, an increased temperature is always favourable to their laying, and for the rearing of young chickens. Precautions must be taken to keep out the rains, and the keen blasts of winter, and during the continuance of unfavourable weather, the fowls must be kept shut up in their house, as rain is so injurious to them that their laying will be retarded for a long period by a thorough wetting.

The floor of the fowl-house should be formed of chalk and earth, thoroughly beaten down to form a compact solid mass, which the fowls cannot tear up, and which will bear frequent sweepings. This floor should constantly be kept clean, and well sprinkled with sand or dry ashes, and there should also be several holes filled with either of these materials, for the fowls to wallow in, as they are accustomed to do, in order to rid themselves of the vermin with which they would otherwise be infested. "A better remedy, and one far speedier and of more certain efficacy, has been

discovered at Windsor by Her Majesty's feeder. The laying nests, at Windsor, are composed of dry heather *(erica tatralix)* and small branches of hawthorn, covered over with white lichen *(lichen rangiferinus.)* These materials, rubbed together by the pressure and motion of the hen, emit a light powder which, making its way between the feathers to the skin, is found to have the effect of dislodging every species of troublesome parasite."

The perches for the fowls to roost on should not be placed one above the other for obvious reasons, but in a continuous line around the house. Pegs driven into the wall may serve as steps for them to ascend to roost, but these must be so arranged as to form a proper slope for their convenience.

The nests for laying are recommended by some to be formed in boxes or baskets, arranged around the room, either upon the floor or at any height that may be convenient. Clean straw is preferable to hay for nests, as being less liable to harbour vermin or become musty.

But the best form is a box with a side entrance, as the hen is not so liable to break the eggs as when she jumps down from the top upon them. The more secluded the nest can be placed the better, as the hen is so fastidious and prudish, and has so much mystery about her laying, that she *will* have secrecy. If you watch her proceedings, she is annoyed, and is probably prevented from laying, and may be stopped altogether for some time.

In the nests there should be several chalk eggs, in order to induce the hens to lay there.

After the fowls have gone out, the door and window of the house should be opened, and occasionally a small quantity of hay should be burned in it to renew the air, and to destroy noxious insects. The nests, perches, food-troughs, &c., should be frequently scraped and washed, and the ground often swept, scraped, and covered with ashes.

Food.—Nature teaches the fowl the kind of food

most suitable, and in this, as in all other matters, if we follow nature, we shall do much better than by adopting the notions of those persons who recommend the most extraordinary compounds as food for fowls. "They are of all birds the most easy to feed; nothing is lost to them, they are seen the whole day long incessantly busied in scratching, searching, and picking up a living. The finest, the most imperceptible seed, cannot escape the piercing look of a fowl. The fly that is most rapid in its flight cannot screen itself from the promptitude with which she darts her bill; the worm which comes to breathe at the surface of the earth, has not time to shrink from her glance, but is immediately seized. The food of fowls consists of several sorts of grain, fruit, insects, and worms. A good way to rid the gardens of caterpillars, worms, and other little creatures that eat up the produce, would be to let in hens, if by their habit of scratching the ground they did not cause more damage than service. Dressed or raw flesh is likewise suited to the taste of these birds; and they are very fond of mulberries and some other fruits.

"Fowls that feast on seeds, worms, insects, with everything they have found, in an obstinate search on the dunghill, in the yards, in the barns, in the stables, &c., only want at the farms, in spring and winter, a supplementary feed, which is always distributed to them in the morning at sun-rise, and in the evening before it sets."

Mowbray tells us, that instead of giving ordinary or TAIL CORN to poultry, he always found it most advantageous to allow the heaviest and best. This high feeding shows itself not only in the size and flesh of the fowls, but in the size, weight, and substantial goodness of their eggs, which will prove far superior to the eggs of fowls fed upon ordinary corn, or washy potatos; two eggs of the former going farther in domestic use than three of the latter. The water also given to fowls should be often renewed, fresh and

clean,—indeed, those that have been well kept, turn with disgust from ordinary food and foul water.

Barley is the best corn for poultry, it should form their staple food. Oats are sometimes used, but not so advantageously, besides they are apt to scour young chickens. They are recommended by some as promoting laying, but for this purpose hemp-seed, buckwheat and millet, are better substitutes.

Maize, or Indian corn, is an excellent article of food. For either the ordinary keep, or for fattening fowls, it should be given whole, or slightly bruised, and will be found more profitable than any other grain. Sunflower seed has been much praised as food for poultry, it may be used economically in connexion with other food, in the saving of grain. The head of the flower, containing the ripe seed, may be cut off and thrown to the fowls; picking out the seeds serves for their amusement.

To keep fowls in health, they should be supplied with a sufficiency of vegetable diet, such as cabbage, lettuce, beet, carrots, potatos, &c., either raw or boiled. In the winter, too, when they cannot procure worms or insects, it is very necessary to give them small quantities of animal food, as bacon-rind, odd bits of meat, &c., chopped small, as substitutes; or the bones may be given to them to pick, which will be of great service in forwarding their laying.

Instinct causes the fowl to swallow small gravel stones and other hard substances, which are taken into the gizzard, and assist digestion by grinding the food. There should always be a good supply of gravel and pounded bricks for them to resort to.

The egg-shell being principally composed of carbonate of lime, it is important that laying hens should have access to lime, chalk, or broken plaster and mortar from walls, otherwise they will not lay so plentifully, and many of the eggs will be *soft*, that is, destitute of the outer hard envelope; this must be particularly attended to in winter, when snow is on the

ground, and at other seasons when they may be prevented from going abroad.

When soft eggs are laid, it would be well to put a little chalk in the water which the fowls drink. They must always have a constant supply, pure and clean; dirty water is the sure promoter of disease.

DISEASES.—*Gapes and Pip.* It is very commonly but erroneously supposed, that these two diseases are identical, the mistake arising, first, from similarity in the symptoms, gaping being usual with both, and indeed many other diseases among fowls; and secondly, from want of proper observation. They are however decidedly distinct, and consequently require different treatment. Gapes is occasioned by the irritation arising from a number of small worms in the throat of the fowl: the seat of the other disease is the tip of the tongue, which on examination will appear discoloured and dead; it is, in fact, covered with a hard scale, the result of internal fever.

As to the remedy many opinions exist, and, as a matter of course, no little difference is observable among them: acting, however, on the principle that prevention is better than cure, it will be found the safest plan to secure early chickens; those hatched in March and April are seldom attacked, while late birds, in many situations, are frequently affected. Among the predisposing causes to both these diseases we may mention damp roosts, a most prolific source of trouble and disappointment to the owner of poultry of every kind. To cure the gapes, dip a feather or small straw into sweet oil, and thrust it about two inches down the windpipe: this disease is very dangerous and must have immediate attention or the maggots increase, till they cause suffocation. In cases of pip, remove the horny scale before mentioned in a careful manner, with the aid of a strong needle or piece of wire. By a little care and dexterity in holding the fowl, it may be accomplished in a few minutes, after which the tongue will swell considerably, but in a few days is entirely recovered. Dirty

water, want of green meat, and any unwholesomeness in the air or food, are alike productive of these diseases.

HATCHING AND REARING THE YOUNG BROOD.—The eggs for setting on must not be more than three weeks old, for fresh eggs produce the healthiest chickens, and are easiest to be hatched. Choose those eggs which have been properly fecundated; those of your own best hens of two years old are to be preferred, as you may be sure of them, if you have taken care to allow but five or six hens to one cock, for the purpose of producing eggs for hatching. If you examine the eggs by candle-light, a small vacancy or air-bladder may be observed in the interior, at the larger end of the egg; if this be exactly in the centre, it is the germ of the male bird, but if a little on one side, it is that of the female; this is useful to be known, as then the supply of either kind can be properly regulated.

When the eggs are thus chosen as soon as possible after they are laid, they should be put away in dry saw-dust, in a cool place, until the time of setting.

The number of eggs given to a hen for hatching must be proportioned to her size and ability to cover them. More, however, may be given in summer than in winter; a hen that will hatch sixteen or eighteen in May or June, should not have more than twelve in February or March.

The desire of most hens to sit when they have finished laying is very great, but it is not enough that they appear to have a disposition for it, as it often happens that a hen will commence incubation, and then forsake her nest after sitting on the eggs sufficient time to addle them. Those most likely to perform the service best are at least two years old, not easily frightened, having large wings, and their bodies well supplied with feathers,—above all, with short legs that they may sit close.

To try the qualification of the hen, she should be set for a few days on a nest with some worthless

eggs; if she appear steady, and there is reason to suppose the sitting will be permanent, let the useless eggs be removed and the selected eggs placed under her; she may then be covered with a clean cloth, as a necessary precaution against her leaving her nest. When her morning meal is given, the cloth may be taken off, and replaced as soon as she has entered the nest. Some hens sit so constantly, that it is absolutely necessary to lift them off their nests in order that they may take food and drink; corn and water should be placed near them, that if they please they may take what they require at any time. Great care must be taken that the eggs be preserved from cold, especially towards the end of hatching, or the young ones will certainly perish in their shells.

Spring and autumn are the most favourable times for sitting; then eggs are more plentiful and in better condition, and the temperature is more suitable.

The eggs should never be disturbed after they are in the nest; recent experiments have proved that they need not be turned as generally practised, but that this should be left to nature.

On the twenty-first day after incubation, hatching is usually complete; the little chicks peck through the shell, and free themselves from their prison. No attempt should be made to break the shell and liberate them before the time, though a little assistance is sometimes necessary, when some are found too weak to free themselves by their own efforts; but this requires great care and dexterity, as the least injury inflicted results in the death of the chicken. Rather than be too hasty, it will be better to wait at least twelve hours before attempting their liberation.

The chickens first hatched are to be taken away from the hen, lest she should be tempted to forsake her nest, leaving some to perish. They should be placed in a basket with wool, and if the weather be cold, put in a warm apartment or near the fire. They will not require food for twenty-four hours, by which time all the rest of the brood will be hatched; they

are then to be placed altogether with the hen under a coop, in a place apart, and supplied with food and water. Bread crumbs, or the smallest grains of wheat form the best food, or oatmeal slightly moistened, and curds chopped small may be given. The water must be very clean and fresh, and placed in such pans that they may be able to drink from without wetting themselves. The hen need not be cooped more than three days, she will scratch for worms and insects, which will be highly beneficial to her young brood. In a few days, the chickens will eat almost anything; a little animal food, or earth-worms chopped fine, forms excellent nourishment for them.

They must not be let out very early in the morning, or when the dew is on the ground, nor suffered to roam among the damp grass; cold and moisture is highly prejudicial and frequently fatal to them.

PRODUCE, PROFIT, &c.—On this head we may quote from Cobbett's Cottage Economy. "When fowls can be kept conveniently about a cottage, three, four, or half a dozen hens, to lay in *winter*, when the wife is at *home* the greater part of the time, are worth attention. They would require but little room, might be bought in November and sold in April, and six of them, with proper care, might be made to clear every week the price of a gallon of flour. If the labour were great, I should not think of it; but, it is *none;* and I am for neglecting nothing in the way of pains in order to ensure a hot dinner every day in winter, when the man comes home from work."

Eggs are usually sold at such prices as to place them beyond the means of many families as ordinary articles of food. But this need not be, for almost any one can, without much trouble or expense, have a constant supply of new laid eggs, even during the winter, when they are most valuable. And who would not take a great deal of trouble for the sake of a fresh egg for breakfast every morning?

If you have a convenient out-house, such as we have described, put into it, in October, a dozen fowls,

viz.,—one cock and eleven hens. Let their habitation be kept warm, and be well sheltered from all storms and cold blasts. With an abundant and constant supply of food and water, these fowls will furnish you with six eggs daily on an average. Lime and animal food must be regularly given, and their apartment kept perfectly clean. If any hen desires to sit, she may be shut up in the dark for a short time, and well supplied with food, and in a few days her inclination will be gone, and she may be restored to her companions. It has been stated, that without a cock the hens will lay quite as abundantly, and without evincing any desire to sit.

The fowls thus precluded from other means of obtaining food, will require about a quart of corn a day, or fourteen bushels a year. Let them always have plenty by them in a little trough, they will then feed regularly but sparingly, very often; whereas, if you *feed* them, instead of allowing them to take it as they please, they will ravenously devour all you scatter, fill their crops to distension, and cease laying.

These fowls, if properly managed, will afford you 2000 eggs in the year, and if you please one hundred chickens besides. Now the expense of feeding the fowls and the chickens will be the cost of about eighteen bushels of corn, say of barley, at four shillings the bushel, the amount will be £3 12s. The eggs as they are sold retail in towns, usually averaging in value one shilling a dozen, would be worth £8, and the chickens, at one shilling each, £5, thus giving a clear profit of more than £9 from the produce of your dozen fowls. We must not say anything about the expense of management or attendance, this we do not reckon, as it is a pleasant occupation, rather an *amusement*, to be looking after fowls.*

* To Make Hens Lay Perpetually.—"Hens will lay eggs perpetually if treated in the following manner:—Keep no roosters (cocks): give the hens fresh meat, chopped up like sausage meat, once a day, a very small portion—say half an

The breeding and fattening of fowls for the market is a profitable occupation; there is always a great demand for young fatted fowls, which realise prices proportionate to the difficulty with which they are usually obtained; five shillings a couple is considered a very moderate price. Mowbray says, "Twenty dozen fowls were purchased at Wokingham, in Berks, for one gala at Windsor, after the rate of half-a-guinea the couple. At some seasons, fifteen shillings have been paid for a couple."

The cost of breeding and fattening one hundred chickens cannot exceed £5, and if they are sold to the retailer at two-thirds of the market price, a profit, varying in accordance with that price, from 50 to 100 per cent. would arise to the producer.

We will take up the remarks of Richardson as to the profit to be derived from eggs. "Some very interesting experiments, relative to the production of eggs, were made about ten years ago, by Mr. Mourt, of Stoke, near Guildford. He obtained three pullets of the Polish breed, on the 1st of December, 1835, which had been hatched in June previous, and they commenced laying on the 15th of the same month. They laid from the 1st of December, 1835, to the 1st of December, 1836, between them, the number of 524. During the year they consumed three bushels

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ounce a day—to each hen, during the winter, or from the time insects disappear in the fall time, till they appear again in the spring. Never allow any eggs to remain the nest for what are called nest eggs. When the roosters do not run with the hens, and no nest eggs are left in the nest, the hens will not cease laying after the production of twelve or fifteen eggs, as they always do when roosters and nest eggs are allowed; but continue laying perpetually. My hens lay all the winter, each from seventy-five to one hundred eggs in succession. If the above plan were generally followed, eggs would be just as plentiful in winter as they are in summer. The only reason why hens do not lay in winter as freely as in summer is the want of animal food, which they get in summer in abundance, in the form of insects. I have for several winters reduced my theory to practice, and proved its entire correctness."——*American Paper.*

of barley, seventeen pounds of rice, and a small portion of barley-meal and peas; the cost of which amounted to about 16s. 10d. The number of eggs being 524, gives about thirty-one eggs per every shilling expended, and assuming the weight of each egg to be one and a-quarter ounce, we have a result of forty-one pounds of the most nutritious food that can possibly be procured, at the low cost of 4½d. per pound; or if the eggs were, instead of being consumed, sold to the retailer, a profit of about 100 per cent. would have accrued to the producer."

"Out of 72,000,000 eggs annually imported into England from France, Germany, the Netherlands, and other countries, France contributes 55,000,000. Calculating the first cost at 4½d. per dozen, England pays annually to France for eggs about £77,000.

It will surely be worth while for the cottagers and other industrious classes of this country to endeavour to carry out in practice the instructions we have given for poultry management, and thereby be enabled to supply the constant demand for home consumption, both of eggs and chickens. By doing this they will realise considerable profit, add to their individual comfort, and increase their independence.

In conclusion, we use, with some trifling alterations, the words of a writer before quoted, "If only one person in every district exerted himself to disseminate among his humbler neighbours such knowledge as I have endeavoured to convey in the course of this article, they would treble the amount of their gains; nor need selfishness interfere with the good work. there would be an abundant market for all. Let landlords only give a little advice and encouragement to their poorer tenantry; let them furnish each townland with a good SPANISH or DORKING cock, or a brace of them, and let them give to such as deserve it, either by industry or some other description of merit, a few good eggs, and they will diffuse much benefit at a trifling cost."

GEESE.

Like the domestic fowl, the tame goose has been celebrated from remote antiquity. The cackling of geese saved the Capitol of Rome from destruction when the city was taken and pillaged by the Gauls. The custom of eating roast goose on Michaelmas-day, arose from the circumstance of Queen Elizabeth having one on her table when she heard of the scattering of the Spanish Armada.

We shall not treat on the numerous varieties of *wild*, or even *tame* geese, our object being rather to direct attention to means of profit, than to entertain our readers with treatises and speculations on subjects not likely to prove of advantage, except to scientific persons.

The common goose scarcely needs description, it is to be seen almost anywhere in the country. It is usually white and grey mixed, sometimes quite white, especially among the males. The mixed or particoloured is supposed to be less vagrant in its habits than the grey goose, and the feathers are more valuable; but the latter is more prolific, and produces the finest young ones. The gander should be a pure white, and of a large size.

A single breeding stock consists of a gander and five geese; these are enough for an ordinary farmyard, as they will produce forty or fifty young in the season. They may be lodged in almost any common place or out-house; they are fond of a clean and dry spot in which to pass the night; and attention to provide them with plenty of fresh straw preserves them from vermin, and improves their health and condition.

It is not absolutely needful to have a pond for them; many persons keep geese successfully who have not this advantage; yet if there should be a pond or stream in their vicinity, it will be of benefit to them, as affording them the means of gratifying the instinct of their nature. Abundance of clean water must be provided when there is no river or pond near. Persons whose premises are confined, cannot profitably keep geese for breeding, as a meadow or common is necessary for them to range in, from which to procure the greater part of their food; for if it be necessary to feed them much, no profit will be obtained.

To have early broods is advantageous that the young geese may be full-grown when the time arrives for disposing of them; and also because a second brood may then sometimes be obtained in the same year. The Chinese geese which have been introduced into this country for many years, commence laying in in November, and in mild seasons the goslings are hatched in January, which if kept warm and dry, and well fed, are ready for the spit by May.

The laying of the goose may be hastened by feeding them well all through the winter upon good solid corn; in January other stimulating food should be given in addition, such as bread or pollard soaked in beer, barley-meal in milk, malt, fresh grains, or Indian corn either whole or ground. The time of commencing laying is usually the beginning of February. An egg is laid every alternate day, or if the weather be warm, two in three days, until ten or twelve are produced. If removed as soon as they have been deposited in the nest, the goose will continue to lay for a much longer period, or until there are from twenty to thirty eggs; and at harvest-time she will begin to lay again, and probably produce as many more. Instances are on record of geese producing seventy, and even one hundred eggs in a year.

The time of laying may be known by the goose carrying straws to form her nest; when this is seen, a nest of straw, lined with soft hay, should be pre-

paved in the place intended for her to deposit her eggs. Nettles strewed around are said to attract them to any desired spot, as they are fond of the smell. Food and water must be placed near the nest, and when one egg is laid, she will continue to lay in the same place. The number of eggs usually allowed is eleven, but there is no reason why more should not be given them, according as the goose may be able to cover them. If the goose should want to sit after laying only a few eggs, she must be prevented until a sufficient number is ready for her. Where many geese are kept, the desired number may be made up from the nests of others. Eggs may be hatched under a hen; four or five are as many as she will be able to keep warm. Turkey hens are kept in some parts of France for sitting on goose eggs; they are able to cover fifteen or sixteen eggs.

While the goose is sitting, food and water should be placed near her nest, that she may not be obliged to quit it for any length of time, and the eggs thereby become cold and addled. No harm will arrive from the gander being allowed to be near; he seems to watch with interest for the time when the young shall be hatched. In Lincolnshire the practice of breaking the shell to let out the gosling is resorted to, perhaps with less danger than attends the breaking of hen's eggs for the same purpose. About the thirtieth day the eggs will begin to be hatched; as the young come forth irregularly, those first produced must be removed, if the goose will allow it, and kept warm before a fire, and replaced with the parent when the whole are hatched.

The goslings should not be fed for twelve hours. If the weather be warm, they may, after two days, be turned out into the open air, care being taken that they do not go out too early in the morning, that they do not remain out too late, and that they be well sheltered from the wind and rain; they must also be prevented from going into the water until they are a week or more old, as they are very liable to

the cramp. Their food may be either warm bread and milk, or thin barley-meal and water, curdled milk with lettuce leaves, and the plant called *goosegrass* or *clivers*, which grows so plentifully in early spring, and of which they are very fond.

After a few days they may be allowed to go abroad with the parent, but care must be taken to destroy all nightshade, hemlock and henbane that may be growing near their haunts, as they will eat these things and poison themselves. When they have a common to range over, and a pond to frequent, they will scarcely require any feeding; vegetables from the garden may occasionally be given, but beyond this, they will get their own living.

There are very many processes and different kinds of food recommended for fattening geese, some of them expensive and others unnecessary, as an over-fattened goose is anything but a delicacy. The best method is that practised by Cobbett, and which, as we have proved its practical value, we shall now quote:—'Geese are raised by *grazing*; but to fat them something more is required. Corn of some sort, or boiled Swedish turnips, or carrots, or white cabbages, or lettuces, make the best fatting. The modes that are resorted to by the French for fatting geese, are I hope such as Englishmen will never think of. He who can deliberately inflict *torture* upon an animal, in order to heighten the pleasure his palate is to receive in eating it, is an abuser of the authority which God has given him, and is, indeed, a tyrant in his heart. Who would think himself safe, if at the *mercy* of such a man?

'Geese are generally eaten at the age when they are called green geese, or after they have got their full and entire growth, which is not until the latter part of October. Green geese are tasteless squabs; loose, flabby things; no rich taste in them; and, in short, a very indifferent sort of dish. The full-grown goose has solidity in it; but it is *hard* as well as solid, and in place of being *rich*, it is strong. Now there is a

middle course to take. For three years, including the present year, I have had the finest geese that I ever saw or heard of. I have bought from twenty to thirty every one of these years. I buy them off the common late in June or very early in July. They have cost me from two shillings to three shillings each, first purchase. I bring the flock home and put them in a pen, about 20 feet square, where I keep them well littered with straw, so as for them not to get filthy. They have one trough in which I give them dry oats, and they have another trough where they have constantly plenty of clean water. Besides these, we give them two or three times a day a parcel of lettuces out of the garden. We give them such as are going to seed generally, but the better the lettuces are, the better the geese. If we have not lettuces to spare, we give them cabbages, either loaved or unloaved; though, observe, the white cabbage as well as the white lettuce, that is to say, the loaved cabbage or lettuce, are a great deal better than those that are not loaved. This is the food of my geese. They thrive exceedingly upon this food. After we have had the flock about ten days we begin to kill, and we proceed once or twice a-week till about the middle of October, sometimes later. A great number of persons who have eaten of these geese, have all declared that they did not imagine that a goose could be brought to be so good a bird. I should think that the cabbages or lettuces perform half the work of keeping and fattening my geese; and these are things that really cost nothing. I should think that the geese, upon an average, do not consume more than a shilling's-worth of oats each; so that we have these beautiful geese for about four shillings each. No money will buy me such a goose in London; but the thing that I can get nearest to it will cost me seven shillings. Every gentleman has a garden. That garden has, in the month of July, a waggon-load at least of lettuces and cabbages to throw away. Nothing is attended with so little trouble as these

geese. There is hardly anybody near London that has not room for the purposes here mentioned."

Geese will almost grow fat when turned into the stubble-fields after harvest, which is of great importance to the farmer, as their dung is a powerful manure, and is said to be a great improver of coarse grass lands.

The profit on geese, from their flesh and feathers, and their dung even, may be an important consideration for the cottager who has a common near his dwelling, and a garden to supply them with vegetables. The price of feathers is about half-a-crown a pound.

Much barbarity has been said to be practised in plucking the living geese, in those counties where they are annually deprived of their feathers; from want of dexterity in the operator, many are so torn and mangled as to occasion their death; while the cold nights frequently carry off hundreds of the poor things which have been stripped of their warm plumage. No effectual remedy for what appears to be almost an act of necessity, has however been proposed.

Geese are subject to diarrhœa or looseness: for this complaint hot ale, in which acorns, quinces, or bark has been boiled, may be given them. When they are attacked by giddiness, the remedy is bleeding, by pricking with a needle a vein which is under the skin that separates the claws. Insects get into the ears and nostrils of goslings, and are a dreadful annoyance to them; in such a case, give them barley at the bottom of a pan of water, so that when the goslings plunge their heads to eat the barley, the insects will be destroyed, or fly away.

DUCKS.

Besides the common English duck, there is a very great variety of which, however, only three kinds are usually found in our farm-yards; these are the Rhone or Rouen Duck, the Muscovy, and the White Aylesbury.

The Rhone is dark-coloured, of rather large size, but is now almost entirely bred in with the native kind. The Muscovy, so called, not from its country, but from the strong musky odour it emits, is much larger than the common duck; in length it sometimes exceeds two feet, and nearly three feet measured across the wings, when they are extended. A red patch covers each side of the head. Its colour in its native state is nearly black, shaded with shining green, with a stripe of white on the wings, and the bill and legs red. It is considered profitable from being more productive than others, and because it fattens very readily, but on account of its musky flavour, is generally discarded from the table. If, however, the glands near the tail, and the head be cut off as soon as the duck is killed, the disagreeable taste is removed, and the flesh somewhat resembles that of the wild duck.

The White Aylesbury is the most ornamental, as well as the most profitable, and, of course, is on these accounts to be preferred. It is very plentiful in Buckinghamshire, from whence vast quantities are sent to the London markets.

Among all the varieties, the drake is larger than the duck, his colours are also more striking and brilliant; he is also distinguished by a tuft of feathers

turning upwards at the tail. One drake is sufficient for six ducks.

February is the period when laying commences, and if not interrupted by setting, from fifty to sixty eggs are produced. A duck is reported to have laid eighty-five eggs in as many successive days.

During the laying season, they must be well looked after, as they will deposit their eggs in any place where they may happen to be, sometimes even in the water. They are more difficult to keep in confinement than the goose, and there is more trouble in getting them to take to a nest, but as they usually lay in the night, or early in the morning, a little care in giving food near the place, and in preparing a nest, will generally be sufficient, and when once accustomed to a nest, they seldom forsake it.

The anxiety of ducks for sitting is not generally so great as with domestic fowls, and it often happens that they remain so long away, from the nest, that the eggs become chilled, and spoiled in consequence. Hence *hens* are sometimes used for hatching ducks' eggs, not only from sitting better, but also from being more careful mothers in leading the young brood *from*, rather than *to*, the water, which is injurious to them when very young.

The number of eggs given for a duck to hatch is from eleven to fifteen. The period of sitting is thirty-one days. If the eggs are not of the duck's own laying, they should be all of the same colour as her own, as she will sometimes turn out from her nest those of a different shade, or those belonging to other ducks. During incubation or sitting, food must be placed beside her, and an opportunity may be sometimes afforded her of going into the water for a short period. The duck will often cover her eggs with hay or straw, or leaves, in order to prevent them growing cool in her absence.

There is no necessity for removing the young ducklings as they are hatched; they are hardy, and may be left to the care of the parent. In fine weather, as

soon as all are hatched, they may be allowed to run on the grass, the duck or hen being confined under a coop, with food made of oat or barley-meal in water, near at hand.

In France, when the ducklings are a week or ten days old, they get mashed potatos, mashed acorns, vegetables boiled, chopped up, and mixed with bran.

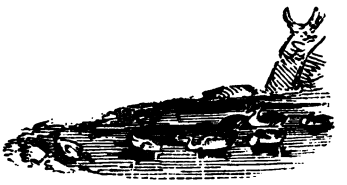
Very soon they may begin to eat almost anything, for ducks are so voracious, and so little particular as to kind or quality in their food, that any offal, however disgusting, seems not to come amiss to them. Thus Cobbett says, "A dead rat, three-parts rotten, is a feast for them." They seek their food ravenously, whether on land, in the water, or in mud; worms, slugs, snails, caterpillars, insects, &c., &c., are acceptable to them. Thus they are sometimes advantageously allowed to forage for themselves in gardens, where they effect good by destroying these creatures in addition to finding a great portion of their food. On this account the duck is the least expensive kind of live stock for any one to keep, and may be turned to profitable account by those who have the room, and will take the necessary pains to rear them. Young ducks should not be allowed to eat too gluttonously of slugs or worms, or they will kill themselves in doing so.

It will not do to bring ducks to table if they have only been fed on such refuse food or garbage. In order to fatten them, or to render their flesh delicate, it is necessary to give good oats, plenty of clean fresh vegetables and water. Or, as they do abroad, cram them with paste made of buck-wheat, or ground malt, mixed with milk, for eight or ten days, which makes them fat and well-flavoured. Ducks may also be fattened upon acorns, of which they are very fond; the flesh is, however, not so tender or delicate as when fed by other means.

Cobbett further states—"I treat ducks precisely as I do my geese. I buy a troop when they are young, and put them in a pen, and feed them upon oats,

cabbages, lettuces and water, and have the place kept very clean. My ducks are, in consequence of this, a great deal more fine and delicate than any others I know anything of."

The feathers of ducks are not so valuable as those of the goose, but yet the profit to be derived from the eggs, the flesh, the feathers, and even from the dung, would be of considerable importance to the cottager, especially where there is the advantage of a free, open range, where there are ponds or marshes, or even a ditch, in which they can forage out food for themselves.



PIGEONS.

THIS extremely beautiful race of birds has been held in high estimation, both in ancient and modern times, as well for the pleasing amusement they afford, as for the profit to be derived from them as articles of sale, or of domestic consumption.

There are so many varieties of pigeons that it will be scarcely worth while to enumerate them, it being more to our purpose to treat of those most useful to man, rather than of mere fancy breeds. There is no advantage in keeping the latter in preference to the common *house* or *dovecote* pigeon, although if a certain market could be always found, it might be profitable to raise fancy pigeons for sale.

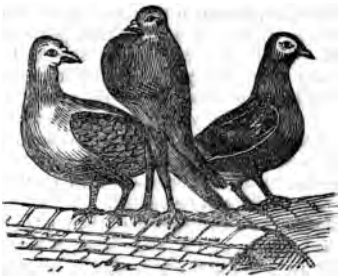
We therefore advise those who intend to keep pigeons, not to trouble themselves about Carriers, Fan Tails, Pouters, Tumblers, &c., &c., as they will in general be found to be "more plague than profit;" but to confine their attention to the common pigeon, which has this recommendation that it breeds oftenest and attends best to its young.

It has been said that if pigeons be permitted to fly abroad to seek their food, little expense will be incurred for their keep, while the value of their young will be of some importance to the cottager. But this, although it may be a very *cheap* way to the owner of pigeons, would not be very honest. It would be keeping them at the expense of others, for during the greater part of the year, they are able to procure their food from the fields, or from the stacks in the farm-yard.

It may be, and indeed *is* very often said, that 'the farmer will never miss what the pigeons take;' and

thus because the robbery appears to be but trifling, and will never be missed, no harm is seen in it. But *real* honesty asks not whether it is much or little that is taken, or whether the fact be known or unknown, but acts simply on the golden rule, "*do unto others as you would have others do unto you.*"

To prevent injustice to the tiller of the soil, those who keep pigeons must feed them regularly and abundantly, a plan which so attaches them to their home, that it is often difficult to get them to fly abroad for air and exercise; but entirely prevents those frequent losses from straying and by robbery, to which those who allow their pigeons to pilfer their neighbour's produce are so constantly subject.



PIGEON-HOUSE.—When many pigeons are to be kept, the best place is an empty chamber or garret, which is warm and dry, and where they can be open to observation. The space between the roof of a house and the ceiling of the upper chamber may be very well appropriated for this purpose. An opening should be made through the tiles or slates for the going in and out of the pigeons, and have a covering resembling a dormer or garret window, in order to

keep the wet out. This outlet should, if possible, face the south, or south-east, and be well-sheltered from cold, from high winds, and heavy rain; because if much exposed to the weather, the growth of the young pigeons is delayed, and the health of the older ones sensibly affected.

Around the interior of the loft, a row of compartments for the pigeons must be fixed at any convenient height. Shelves placed one above another at eighteen inches apart, and divided by partitions placed at the same distance from each other, then boarded up in front, leaving outlets for the pigeons, is the simplest plan that can be adopted. Any boy with a little ingenuity, will be able to construct these apartments, as it is not necessary that any fixed plan should be followed, only care should be taken to allow height enough for fancy breeds if they are kept, and eighteen inches will be quite sufficient for that purpose.

NESTS.—Each pair of pigeons should have two nests closely adjoining, yet separated from each other by a partition; for good breeders, generally at the same time they have young to attend to, have also eggs to hatch, and where there is no separation between the nests, the hen while sitting may be annoyed by the young birds, and compelled to quit her nest, and the eggs be broken or addled.

The pigeon lays two eggs and then sits; the eggs are hatched nearly at the same time, as she does not sit closely upon the first egg until the second is laid. The nest is of the rudest possible construction; a few sticks or straws laid across each other generally serve the purpose; often, indeed, pigeons do not take the trouble to make a nest at all, but lay their eggs upon the flat surface of the floor of their nests, in which case the eggs do not lie closely together during the progress of incubation, but are in danger of being broken by rolling on to the ground. In Germany, to prevent this, nests are provided made of straw, something like the top of a bee-hive turned upside

down; the eggs naturally roll together at the bottom, and receive equal warmth while hatching.

FOOD AND WATER.—Tares or small horse-beans, called '*pigeons' beans*,' form the best, as well as the cheapest food for pigeons; but peas, both grey and white, barley, wheat, hemp, and rape seeds, may be occasionally given with advantage. The food, of whatever kind, should be supplied twice a-day, early in the morning and in the afternoon. On each occasion, just as much as they can eat should be given, so that there may be no waste by the scattering about of the grain, which is the case when a supply is always kept on the floor of the pigeon-house.

A constant supply of fresh water must be provided, not only for drink, but also that the pigeons may bathe themselves, which they frequently have occasion to do, in order to rid themselves af vermin. A large earthen pan will answer for both purposes, but the water must be often changed.

The floor of the pigeon-house should be strewed with fine gravel, which is as necessary and beneficial to the health of pigeons as it is to fowls. A little lime rubbish sprinkled with salt and water is also beneficial. Pigeons are very fond of salt, and for this reason the '*salt cat*' is often introduced into the house: not a *real* pussy, but a composition of the following materials:—about a gallon each of gravel, earth, and old mortar from walls, half a pound each of carraway, hemp, and mustard seeds, two or three ounces of bay salt, all to be well mixed with strong brine, and then baked in a pan, as a cake or pudding. When sufficiently dried, and become cold, it is to be placed upon the floor of the pigeon-house, where it will afford a constant source of enjoyment to the pigeons in picking out the seeds, besides contributing to keep them in health.

It is very doubtful whether such large profits are to be realised by pigeon-keeping as some writers have maintained, who assert that owing to the rapid and prodigious increase which the birds make, there is a

vast gain to be derived. For ourselves, we are quite certain that we have found the expense of maintenance nearly equal to the profit, and we have never met with any satisfactory statement of advantageous results from the advocates of pigeon-keeping, in a financial point of view, notwithstanding that the increase may be as great as sometimes has been stated, that in four years, from a single pair, 14,760 pigeons may be produced. The dung is certainly very valuable, constituting one of the most powerful manures, and if collected from the pigeon-house in considerable quantities, would form an important item in the article of profit.

But apart from the question of gain, there is a consideration in which we entirely concur with a popular writer on this subject; he says "Pigeons are of this use; they are very pretty creatures; very interesting in their manners; they are an object of delight to *children*, and to give *them* the *early habit* of fondness for animals, and of *setting a value* on them is a very great thing. A considerable part of the property of a nation consists of animals. Of course a proportionate part of the cares and labours of a people appertain to the breeding and bringing to perfection those animals; and a labourer is of value in proportion as he is worthy of being entrusted with the care of animals. The most careless fellow cannot hurt a hedge or ditch: but to trust him with the *team* or the *flock* is another matter. And mind, for the *man* to be trustworthy in this respect, the *boy* must have been in the *habit* of being kind and considerate towards animals; and nothing is so likely to give him that excellent habit, as his seeing from his very birth, animals taken great care of, and treated with great kindness by his parents, and now-and-then having a little thing to *call his own*."

RABBITS.

THE present chapter will be about rabbits, those pretty little creatures of which most boys are so fond, and which afford them useful occupation. We are going to give them some useful information respecting the best methods of breeding, rearing, and managing rabbits in general; and our remarks may probably prove useful to older persons, who may think it worth while to take the pains of paying attention to this useful and profitable species of live stock.

Almost every boy in the course of his life takes a fancy to rabbit-keeping, and yet scarcely one boy have we met with who knows how to treat the animals properly. Many rabbits, we are sorry to say, have been starved by neglect, (not wilfully perhaps,) poisoned with filth or foul air, or otherwise destroyed by injurious treatment. While, on the other hand, many are killed with kindness, by supplying them with an over-abundance of certain kinds of food improper for them. We now wish to point out these things, and to give judicious practical directions for the management of rabbits.

RABBIT HOUSE.—The first and most important matter is to have a good dry house or shed, in which the animals can be well protected from damp weather. Too much moisture is as fatal to rabbits as it is to sheep: it gives them the rot. Dampness may be all very well for fishes, but is not good for men, women, and children, nor yet for horses, cows, pigs, poultry, bees, or rabbits; these all thrive better, and are preserved from many diseases, by being protected from it.

But though you keep out the wet from your rab-

bit-house, you must not at the same time exclude fresh air; for rabbits can no more be in health without *fresh air* than human beings. Remember what has been said to you on the subject of ventilation: it is sheer folly to suppose that any living creature can be maintained in health and vigour without an ample supply of that 'balm of life,' FRESH AIR. Disease and death are the natural consequences of a vitiated atmosphere.

Many writers, and among them, Howitt, in that delightful work for boys, '*The Boy's Country Book*,' advise that rabbits should not be kept in hutches, but in little houses, so constructed, that they may have protection from the weather, and at the same time enjoy their liberty and amuse themselves. This house may be built about four or five feet square, as may be convenient, with a roof formed to carry off the rain. The floor should be boarded or paved, to prevent the rabbits from burrowing, and have hay or straw laid on it. Some boxes must be provided, placed on the floor, with the open side downwards, and with holes at the sides for the rabbits to go in or out. Sliding doors to these boxes are convenient to shut in the rabbits when necessary.

In the front of the house there should be a little court or yard railed off, into which the rabbits may be allowed to run when the weather is dry; and here they will sport and enjoy themselves, and give you opportunities of observing their pretty antics.

But this house will only do for *young* rabbits, or until they are about five months old; after that age they would begin to tear each other to pieces, if left together; all the pleasure you had in witnessing their former harmony and happiness would be gone; the bucks would fight dreadfully, and the litters the does might have would be destroyed, so that it is necessary that breeding does should be kept in hutches, and the bucks separated from one another. But we nevertheless advise that young rabbits should be allowed to have their liberty in such a house, as they will be

far more healthy, and will grow much better, than when they are cooped up in hutches, where they have no room to exercise their limbs. Rabbits of any age, from the time they are taken from the doe, up to five months old, may be introduced among the '*happy family*,' in the house; they will be received with cordiality, and will skip and caper about with pleasure, just as boys may do who live in peace and love with their companions.

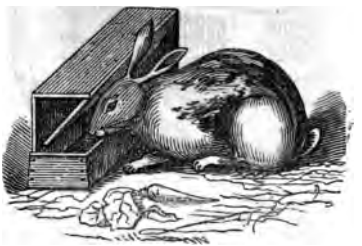
HUTCHES.—The hutches should be made as large as convenient, that the rabbits may not be cramped for want of exercise; those for breeding-does must have a partition, so as to form two apartments, one for feeding, the other as a bed. Single hutches, that is, with one room only, will do for young rabbits or

for bucks to be kept in. The door of the feeding apartment should have wires in it, but that of the bed-place must be of wood, as the doe likes darkness and concealment when she has her litter. It is well

to have a sliding-board to divide the two compartments, and to shut out the rabbits when the hutch is to be cleaned, as it is very inconvenient to do this with the rabbits running about. The floors of the hutches should be quite smooth, that the wet may run off, and in order to facilitate this, a small slit or opening in the floor at the back of the hutch, should be made, and the hutch itself be put sloping, a little higher at front than at the back, for when rabbits have much green food, there is a considerable quantity of moisture which requires to be drained off, that the creatures may be kept dry and clean; and if proper means be taken to receive this into a drain, it forms a very valuable liquid manure.

The hutches may be arranged one above the other around the house, to any convenient height, only it must be observed that each row of hutches should project at the back beyond that under it, in order that the wet may not run down into the hutch beneath. If a trough be placed on the floor behind the hutches, it will serve to carry off the liquid manure into some convenient receptable.

FEEDING TROUGHS are usually made in the form of a long open box, but this is inconvenient in many respects, as the young rabbits get in and spoil the



food, and the older ones scratch out much of it, tread it under foot, and waste it. A better plan is to have

a swinging board in front, the cost of which is soon made up by the food saved. The rabbits when they take their food, push this board inwards with their forehead, and when the head is withdrawn, the board flaps back against the front of the trough. Some persons have a lid to the trough, which the rabbit soon learns to lift, and which shuts down again of itself as soon as the head is taken out of the way.

There are many KINDS OF RABBITS, varying in size, form, colour, length of legs or fur, and position of the ears; but the races have been so continuously intermixed and varied, by breeding, that it is a difficult task to point out any distinct kind as preferable. The smallest and short-legged variety, of the colour of the wild rabbit, appears to be the hardiest. Boys generally prize LOP-EARS, though they are scarcely so pretty in appearance as the common kind. There is a *single* or *double* lop, according as one only, or both ears are dropped. SMUTS, too, are favourites, either single or double. The smut is a black spot on the side of the rabbit's nose, and a spot on each side constitutes the double smut. Some of these are very beautiful creatures, having a white silvery fur, with rich, glossy, black spots, and they are generally large-sized rabbits.

FOOD.—This is an important matter; rabbits eat a very great quantity; you must not think that because they are little animals, they require only a little food; they want much more than you do, in proportion to their size; and to give them proper kinds of food, in sufficient quantity, and at a low expense, constitutes the chief question as regards their profit. How often do we hear it said, and how generally true is the saying, 'Oh! my rabbits never pay, they eat their heads off,' &c., meaning that the expense of the food consumed more than counterbalances the advantage gained. Now, this arises from want of knowledge. For the greater part of the year, rabbits may be kept almost entirely upon food procured from the field or garden. Although green food is naturally the food of rabbits, yet, because when injudiciously

supplied it scours and gives them the rot, it is erroneously supposed that it must be almost entirely withheld. It is true, that if it be given to them in a wet state after rain, if it consist of one kind of vegetable only, or if it be of a watery kind, a bad effect takes place; but when the green food is given in sufficient variety, and with a small supply of good dry hay or oats daily, there is not the least fear in giving an unlimited quantity.

We fed our own rabbits during the past summer entirely on green food for several weeks. This principally consisted of carrot and parsnip tops, strawberry leaves, French bean pods in their unripe state, lettuces, groundsel, and other plants. Cabbage we use as little as possible, the rabbits do not much like it, and it is not very good for them.

We will now give a list of many of the vegetables that are *good* food for rabbits. All through the summer there will be an ample supply from the garden and hedges. Dandelion, groundsel, sow-thistle, dock-leaves, peas-haulm, lettuce; strawberry, raspberry, and currant leaves; carrot, parsnip, potato, and horseradish tops; all kinds of grasses, celery; French beans in the pod, vine dressings, apple parings, &c., &c. But we need not further enumerate, when there is scarcely any vegetable which rabbits will not eat; but before all other things, they prefer parsley, carrot-tops, French-beans, bath leaves, stalks and pods.

As soon as the peas and kidney-beans have done bearing, let them be pulled up and given to the rabbits, together with all the pods not wanted for use. In the autumn, when green food becomes scarcer, we give the waste scarlet-runner stalks, of which they are very fond; also the leaves which now fall in abundance from the apple and other trees; and when the garden supplies fail, there is generally plenty of marsh mallows, docks, ground ivy, and grasses from the hedges, to form an abundance of green food for some time longer.

In the winter, carrots, parsnips, Swede and com-

mon turnips, together with brewers' grains, mixed with toppings or pollard, supply the lack of fresh vegetables. We never use grains in the summer, because they so soon turn sour and mouldy, and much better food can then be obtained.

We must not omit to tell you that rabbits like the young bark of trees; for this reason we supply ours in the winter with small branches and twigs, which they either strip or entirely consume. We throw to the young ones the prunings of vines, currant, apple, and other trees, except such as laurels and evergreens, said to be poisonous. Nibbling these twigs is excellent amusement for rabbits, and besides keeping them in health, serves as a portion of their food.

Here, then, we have shown that there is no need for starving rabbits, when there is such an abundant variety of food suitable for them, and at all times to be procured. One writer observes, that when rabbits die, ninety-nine times out of the hundred *starvation* is the malady; and particularly short-feeding the doe while and before she has young ones.

FEEDING.—It is best to feed rabbits three, or even four times a-day, because when they are fed only twice during that time, a larger quantity of food must be given at each feeding, which is too often wasted. Rabbits appear to relish their food best when given in small quantities, and you will soon learn how much to give at each time you feed, so as to avoid waste, and yet for the rabbits to have enough. The does must be well kept, as we have just said, both before and after they have young ones, or it is useless to expect their produce to be vigorous and healthy. A doe with a litter will eat twice as much as at other times, and must be liberally supplied with green food and carrots and parsnips, raw or boiled, as well as with oats and hay. A few days both before and after *kitting*, every evening, we give to our does a few table spoonfuls of gruel, made either with flour or oatmeal, and we find this a good practice, as the animal appears to suffer a good deal from thirst about that

period; care must be taken not to give this while it is hot, nor is it necessary to give much when there is an abundance of green meat. A little cold water or milk may be given instead of the gruel; we have never found it to hurt any of our rabbits.

Young rabbits, when they first come out to feed, must not be allowed to eat the greens with which the doe is supplied; but they may nibble at carrots and other roots, and at the little twigs we have mentioned, and gradually be accustomed to partake of a more moist diet.

BREEDING.—Rabbits begin to breed when about five or six months old, and will give seven or eight litters in the year, though it is better to allow them only to have five, as too frequent breeding is injurious. In thirty days after being with the buck, the doe produces her young. A few days before the time, some hay must be given to her, with which, and the *down* she pulls from her fur, she will construct her bed It is always a sign of the approaching birth of the young when she begins to bite down the hay, or carry it about in her mouth, and to tear the *flue* from her body. There are generally from four to ten young ones, sometimes more, but it is far better when the doe has so many to keep only five or six of the finest, they will then grow up strong and healthy, and the doe will not be so much weakened as if all had been preserved. At the end of six weeks the young brood may be removed, and the doe and buck come together again. Great care is required during very severe weather, to prevent the young from dying with cold; and for this reason it is better to allow the doe to rest during the winter. The best breeding rabbits are said to be those produced in March.

Like all other animals, rabbits degenerate when much breeding takes place among the same race for a long period: this is called breeding in and in. It is proper, therefore, to make changes from time to time, by procuring a fresh kind to improve your stock. Rabbit fanciers pay some attention to this; but if it

were made more a matter of science, as it is with the race-horse, a very superior breed of rabbits might be produced.

FATTENING.—There is no need to resort to any other method in preparing rabbits for the table than to give them as much oats, carrots, and green food as they choose to take; if fattened with corn alone, the flesh is not so juicy and relishing as when they are also allowed an *unlimited* quantity of vegetables. They are in the greatest perfection from about three to seven months old, and about a month's feeding, as advised, will make them thoroughly fat, provided they have not been half-starved previously. The London poulterers exhibit fine specimens of fatted rabbits at Christmas, some we have seen weighing upwards of fifteen pounds; but it is not desirable to produce such over-fat animals, whether rabbits, or oxen, or sheep.

DISEASES.—Rabbits are generally very healthy and hardy. When due attention is paid to their food, to ventilation, and cleanliness, few animals are less subject to disease; but, as in all other cases, filth, foul air, and damp, produce disease in rabbits. *Looseness*, which may be seen by the dung being too moist, must be remedied by dry food, such as crusts of bread, good corn, old hay, hard biscuit, or any food of a dry quality. The *rot* may be said to be incurable, at least we have found it so with young rabbits. The remedy must be looked for in dry hutches, fresh air and substantial food. The *liver complaint*, another disorder, is said to be also incurable; but as it does not prevent the rabbits from fattening, the best course is to prepare those attacked at once for the table. *Snuffles* or *colds* may be cured by removing the rabbit from the damps and draughts which have produced the disorder to a drier and warmer place. It is much easier to *prevent* disease than to cure. Cleanliness, careful attention, dryness, and regular feeding in the manner we have directed, will in general ensure good health in the rabbits, and entirely prevent any of these diseases.

PROFITS.—Rabbits are really profitable. Three does and a buck will give you a rabbit to eat for *every three days in the year*, which is a very much larger quantity of food than any man will get by spending half his time in the pursuit of *wild* animals, to say nothing of the toil, the tearing of clothes, and the danger of pursuing the latter. When the amazing fecundity of the rabbit is taken into account, it will readily be seen that if the expense of food and management can be kept low, a great profit may be obtained. It is said that from a single pair of rabbits, the prodigious number of one million two hundred and seventy-four thousand, eight hnndred and forty may be produced in four years, supposing all the rabbits to live. We have shown how the least possible expense as to food may be attained, by pointing out the food which costs least, and yet is quite suitable for the animals; and there appears to be no good reason why a person, *living in the country*, who has a shed and a garden, should not derive advantage from the keeping of rabbits, and when the care of them can be entrusted to boys, the cost of management would of course be diminished. The value of the dung, either for sale or for the garden, is considerable, as it is a very valuable manure. For any person living in a town, who has all the food to purchase, to attempt to keep rabbits for profit is out of the question.

A country cottager who kept rabbits in a small house, similar to the one that we have described, gave the management of them to his boys, who carefully attended them and collected their food. Without diminishing his stock, he was able to kill annually between three and four hundred, and derived a good profit from their sale, besides having a rabbit occasionally at dinner for himself and the advantage of the dung for the garden, and this with hardly any expense or trouble to himself.

Some years ago, a person in Oxfordshire kept some hundreds of breeding does in a small detached barn. He sent about three dozen rabbits weekly to London,

but on account of the distance making the expense of carriage great, very little, if any profit was realised on the sale. But the dung produced was equal to one load a week, thirty-six bushels to the load, and sold for eightpence a bushel.

A description of a large breeding establishment has been given by Mowbray, which we shall now quote; 'Of late,' he writes, 'one has arisen at Ampthill, Beds, upon a more extensive scale than ever before attempted, established by an agent of his grace the Duke of Bedford. The building is situated upon an eminence, is square, somewhat resembling barracks, with a court withinside the walls, and with thirty acres of fine light land adjoining, under culture of those crops known to be best adapted to the nourishment and support of rabbit stock. It was proposed to keep between four and five thousand breeding does, which number is probably now complete. The young rabbits, from seven to nine weeks old, are sent to Newgate and Leadenhall markets, fifty to sixty dozen weekly. The quantity of dung produced, which is reserved with the utmost care, and free from any extraneous substances, must be considerable and valuable.'

This business has since come to an end, not it appears from failure, but because the manager had other and more important duties which required his attention. There can be no doubt that boys, in the country especially, where green food can be had for nothing, may make considerable profit by keeping rabbits, and thus be of some use to themselves and to their parents, instead of being, as is too often the case, a troublesome burden. We trust they will *try*, and put our instructions into practice.

THE HONEY BEE.

CHAPTER I.

ADVANTAGES OF BEE-KEEPING.

QUEEN BEE.

DRONE.

WORKING BEE.

THIS remarkable insect has attracted the attention and admiration of mankind in all ages. Its produce is mentioned as one of the chief attractions of the land of promise to the wandering Israelites. The country to which they journeyed was to be "A land flowing with milk and honey." The heathen poets

and historians make frequent reference to this wonderful insect. It was held by them in great veneration. Virgil asserted that a bee was a ray of the divinity; Plutarch, that it was the magazine of virtues. Their views of the natural history of the bee were in many instances sufficiently absurd. Some imagined that they were bred from the purest juice of flowers; others, that they sprung from the putrid flesh of animals. They were also supposed to be endowed with the knowledge of many sciences, of architecture, mathematics, geometry, arithmetic, astrology, logic, &c., &c.

But a more correct knowledge of the natural history of bees was reserved for modern times. Swammerdam, a Dutch physician, and Maraldi and Reaumur, eminent French philosophers, towards the close of the 17th century, by their observations and dissections, threw much light on the habits and secret movements of these little insects. But one of the principal writers on the bee is Francis Huber, an eminent naturalist of the last and present century, who was born at Geneva in 1750, and died at Lausanne in 1831. This enthusiastic naturalist has written a considerable volume upon the Honey Bee. And although recent writers have shown the incorrectness of some of his theories, the work itself is the foundation of our more extended acquaintance with this interesting little creature.

But connected with the natural history of the bee is its great value in the domestic economy of the farmer and cottager. When properly conducted, the culture of these insects becomes a source of considerable pecuniary profit. The successful management of bees requires but a moderate degree of attention and care. The expense is trifling, consisting of the first outlay in procuring a swarm, and providing suitable accommodation in the shape of hives or boxes. The return is very considerable, and may be regarded as clear gain. But before we come to particulars, we shall enter more fully into the advantages to be gained

from keeping these useful and industrious little insects, as few persons would be willing to undertake the care of bees, unless the benefits to be hoped for are clearly pointed out. And first, we may mention the gain in domestic enjoyment; how much of comfort might a few hives of bees be the means of introducing into many families, where the complaint is so frequent—"We cannot get sugar to our tea,"—"We cannot make fruit puddings for our children,"—"We cannot preserve the blackberries and other wild fruits which grow so plentifully around us." Why? "Because we cannot afford to buy sugar."

The answer is:—"Try honey; it is suitable for either of these purposes, and good and wholesome for children, who are very fond of it; or if you do not like honey, sell it and buy sugar—a pound of good honey is worth two pounds of sugar—then your little boys and girls may have a treat. Recollect that you have not to labour for honey, as the slave has to produce sugar; that you have no wages to pay; that when once you have made your few shillings' outlay, all will be profit; your interest will be great, and your stock increasing year by year. The excellence of all is, that the industrious bees will work and toil for you, while you may stand quietly by—not to grow idle, but 'lessons of industry learn.'"

Next, is the pecuniary gain: a large sum of money is annually paid for honey and wax brought into this country from abroad, the amount is variously estimated, it may be taken, however, at about £200,000; and why should not our English cottagers receive the whole of this sum? There can be no good reason why we should spend this money abroad, when we are able to produce as good an article at home. Dr. Mavor tells us of a cottager in Berkshire who cleared £27 in one year by his bees: and there can be no doubt but that with proper attention, we might produce enough wax and honey for our national consumption.

In addition to the positive benefit which would

arise from more extended bee-keeping, there is an indirect but important advantage which must not be overlooked, namely, the increased productiveness of the garden and orchard; for Nature appears to have designed the honey, not primarily for the use of man, but to attract the bees to the blossoms, that they may carry the pollen or dust from flower to flower, and render them fertile. It is a well known botanical fact, that the fructification of plants is accomplished by the farina or dust from the stamens or pistils of what are called the male blossoms being deposited in the interior of the female flowers; and thus orchards have been known to produce double the crop after bees were kept that ever they did before; hence it has been well said, "if there were no bees, there would be no apples."

It is, therefore, much to be regretted that so few persons keep bees, an occupation from which so much pleasure as well as profit may be derived, and so many useful lessons of industry and domestic and political economy may be learned. And it is still more to be deplored, that our country cottagers almost universally neglect this, among the means which might add so much to their comforts and enjoyments. Where ever we go this fact is plain; the little well cultivated garden with its goodly row of bee-hives is wanting. Either the depressing influence of poverty leaves the man without the spirit or the hope of improving his condition, or the domoralizing influence of the beer-shop at once destroys his ability and inclination for engaging in any pursuit of a useful character. How beneficial, on the other hand, would be the result to any family, if the keeping of bees, and the example of their wonderful habits, should lead the father of that family from low and sensual pursuits, to the simple and natural pleasures associated with bee-husbandry in the cultivation of the garden.

CHAPTER II.

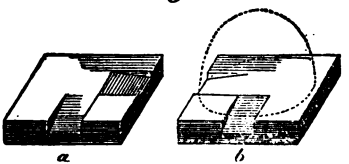
MODERN METHOD OF BEE-KEEPING.

THE usual method of keeping bees in England is that of annual renewal and destruction, a practice to be condemned, not only on the ground of cruelty, but also from the serious loss thereby occasioned. In every other country of Europe the practice is different: bee-keepers never destroy their bees, but take away a portion of their produce, and leave them the remainder for winter sustenance. Thus, some place one hive upon another, and in the autumn remove the upper one: others turn out their hives and cut out as much comb and honey as they think the bees can well spare, and by these means they obtain from 20 lbs. to 40 lbs. of honey from each hive, and still keep up their stock of bees for future seasons. This method, imperfect as it is, is far superior to that adopted by our country people, of burning the bees, as it is called, that is, smothering them with brimstone; and we think we shall be fully able to shew this, notwithstanding Cobbett says, 'It is whimsical to *save* the bees when you take the honey. You must *feed* them; and if saved, they will die of old age before the next fall.' This opinion shows the writer to have been really unacquainted with the natural history of bees, and the economy of bee-keeping. Let us suppose a bee-master in Germany to possess twenty stocks of bees—and many have from 150 to 200—and he takes 80lbs. of honey from each; he has 600 lbs., and still retains his twenty stocks; whereas, by the English method of choosing annually the heaviest and lightest stocks for destruction, supposing that ten hives are taken, and each produces 80lbs., we have but 300lbs. of honey, and only half the stock with which to commence the ensuing year!

But the foreign method, though possessing such

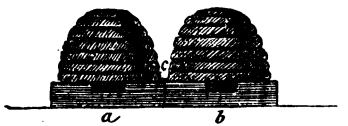
advantages, does not equal what may be done by the better plan of management we are about to explain; in which we wish to enforce a maxim of a celebrated bee-keeper,—NEVER KILL YOUR BEES—because this, and *the prevention of swarming* constitute the grand features of the superior method. "I have said it is best to prevent swarming: now hear the reason. The queen bee lays from 10,000 to 30,000 eggs in the year. In a stock containing 3000 bees, almost all of them in middling years will be busy in nursing the grubs, *for they are such good mothers, that they think it their first duty to feed their young;* gathering honey is their second. A swarm goes off: you have two queens, each with 3000 bees, busy in rearing the eggs which the two queens lay all the summer. They have no spare time to gather honey, and so in a bad year a stock with plenty of bees in it will be often almost empty of honey when you take it up in the autumn, and sometimes even die in the summer if not fed. Now if you prevent swarming by giving them plenty of room, 3000 bees, who were nurses before to the grubs of one queen, will be enough to do the nursing work to the hive, though it is so much larger; for each hive has only one queen, and one queen cannot lay eggs enough to require more nurses, though two may. The other 3000 will store honey for you in the spare room you give them." In order to obtain this spare room, if you have your bees in straw hives, the following is the method: procure two boards, an inch and-a-half or two inches thick, and of a size a little larger than the breadth of your hives; let there be a piece cut out of the front, in a sloping direction, and another piece similarly on the right and left side of each, to answer the double purpose of doorways, and to allow the moisture from the hives to drain away more readily, as shown in Fig. 1. The side entrances must be made to fit exactly, when the boards are placed together. Before swarming time, in May, a well-stocked hive of last year is to be placed on one board,

Fig 1



an empty hive on the other, a small piece of wood being placed over that part of the two entrances which is between the two hives—as at *c*, Fig. 2.

Fig 2



Then stop up the doorway of the full hive, so that the bees may have no way of egress, except through that which is empty, at *b*, and if possible, shift the new entrance along the stool on which you have placed your hives, until it comes opposite the part where the old entrance at *a* was; and this being sprinkled with a little honey or syrup, the bees will be soon accustomed to the change. Here, then, you have given your bees room, and instead of swarming, they will soon commence their work of building and storing in their new abode, while the queen, with the nurses, is occupied in rearing a new brood shortly to

come forth in strength, to assist in the good work. When the hive is full it should be removed, lest the bees, for want of room, should swarm off, or lose many days' work, by hanging out in a cluster at the entrance, as they are often seen to do previously to swarming.

The removal must be effected in this manner: in the middle of a fine day, when most of the bees will be out gathering food, cut off the passage between the two hives, by slipping a piece of tin between the side entrances at *c*, Fig. 2. Shut up the entrance *b*, open that at *a*, and push the hives along the stool, so that the doorway *a* may be over that part of the stool where *b* was. If a great disturbance shortly take place at the mouth of the hive, it is a sign that the queen is in the hive you wish to remove, in which case you must take away the tin which separates them, and wait until another day. If, on the contrary, the bees go on quietly working, you may be sure that the queen is in the old hive, and that all is well. They must then be left until their labours cease in the evening, when, a little before dark, open the entrance *b*, and the prisoners, alarmed at their long separation from their queen, will speedily find their way into the old hive to rejoin her. You may then remove the hive, and placing an empty one in its place, take out the separating slide at *c*, which will leave it ready for operations on the morrow.

Here, then, you have a full hive, perhaps early in June, and that without destroying a single bee, before those on the old plan have commenced their honey gatherings, and at a time when the produce may be disposed of at a higher price than when the honey all comes to market in the autumn. But there is another thing connected with the *anti-swarming* system which is of the greatest importance in bee management—that is VENTILATION.

The queen bee will not lay her eggs in a temperature lower than eighty degrees, as that degree of heat appears to be necessary for hatching the young brood;

therefore, if the new hive be kept cooler than this, she will remain in the old hive to raise her progeny, and there also the workers will deposit the pollen from the anthers of flowers, which forms the *bee bread*, or food of the young offspring; while in the other hive nothing will be placed but the finest wax and honey. To ventilate the hive, have fixed in the top a piece of zinc, as large as a crown piece, punched full of small holes; this must be covered until the bees have commenced their combs, then the covering must be removed. The bees will endeavour to fill up the holes with *propolis*, a gummy substance which they collect from the bark of trees, on which account you must daily keep the holes open by pricking them through with a piece of wire; you will thus ensure a regular and constant current of fresh air through the hive, entering at the doorway and going out at the top, keeping the hive cool, and enabling the bees to perform their work much more quickly and better than they are able to do without ventilation, while the result to yourself will be, that you will have the purest virgin wax and honey.

CHAPTER III.

CAPPING—WHITE'S HIVE—NADIR HIVE, ETC.

It is sometimes useful, early in May, before the bees have acquired sufficient strength to work in the side hive, to place a small box or bell glass at the top, in which the supernumerary workers may employ their leisure in laying up a small store of honey for you. An inverted flower-pot will answer the purpose equally as well as a glass, besides being cheaper and less liable to be broken.

A board should be fitted to the top of the hive, made of 1½ inch deal, as seen in Fig. 3. The dotted lines show the place of the flower-pot; *a* is the hole

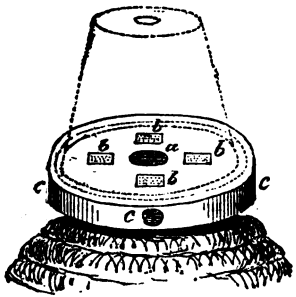


Fig. 3.

for the bees to pass through from the hive; besides this, four square holes, *b*, are to be sunk one inch deep in the board and covered with pieces of perforated zinc. These communicate with four holes, an inch in diameter, bored from the circumference, as at *c*. In this way, when your flower-pot is placed on the board, there will be a current of cold air entering the holes at *c*, passing through those at *b*, and out at the top of the pot, over which a small piece of pierced zinc should also be placed. The cap is in this way effectually ventilated without disturbing the hive, or lowering the temperature required for the breeding of the queen. The bees will stop up the small holes in the zinc at *b*, they must therefore be occasionally opened by passing a piece of wire, bent upwards at the end, through the aperture at *c*. The outer holes must be stopped with corks till the bees begin to work, and at any other time when it is not too hot within. In a good season, the flower-pot will be filled in a week, and may then be removed, by carefully slipping two thin plates of zinc between the flower-pot and the board, then lifting away the upper

plate, together with the pot, to a place of safety; the other plate, which has in the mean time prevented the bees from coming out at the top of the hive, may then be taken off, and a bung placed in the hole at *a*. The bees remaining in the pot may be got rid of by placing them, in the evening, near the mouth of the hive from which they were taken, to which they will return in the manner already described; or they may be subjected to the fumigating process, hereafter to be explained. For several reasons, we are inclined to recommend straw hives in preference to boxes for bee-management: they are more easily procured, they are cheaper, and if properly protected on the outside, have less tendency to contract damp, which is so fatal to bees. Besides, they have a pretty rustic appearance about them, which boxes, however ornamental, are deficient in; and there is nothing that cannot be accomplished with them, in connexion with bottom boards of the kind we have described, at least as well as with boxes. Yet, as most writers on the subject recommend wooden hives, as possessing superior advantages to straw ones, and we have ourselves, in some respects, experimentally proved their value, we shall not deem it amiss to give a description of them. Undoubtedly the best of all is that invented by the Rev. Stephen White, of Holton in Suffolk, nearly one hundred years ago; and which has since received such improvements as to bring it into practicable management. His plan is this: two boards must be prepared in a similar manner to those described for straw hives, (Fig. 1), except that side entrances need not be made in the boards. The front doorway may be lengthened to eight inches; two clamps of wood should also be screwed underneath each board to strengthen it and prevent warping; the two boxes, (Fig. 4), are to be made eleven inches square, and nine inches high inside, of 1½ inch deal or elm, except the sides, which are to be placed together, these need not be more than half an inch thick. "The top of the box ought to project on three sides half an inch

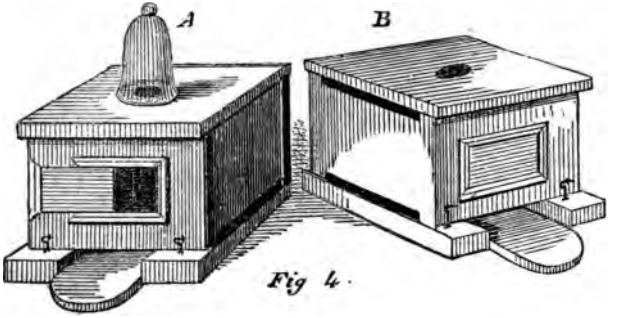


Fig 4.

In the above drawing, the boxes are placed so as to show their construction; when in use they are pushed close together and kept secure by the projecting pieces on the back and front of A.

for better protection and appearance, and as affording convenience for lifting. On the top, a two or three inch hole should be cut in the centre, for placing a bell-glass or small hive, and for the purpose of feeding or ventilation. In making a box, it is best to leave the roof withinside unplaned; if too smooth, the bees often have a difficulty in making the first combs adhere, and they sometimes fall in consequence. A window may be placed at the back and front, or at the end, five inches high and six wide; the glass should be thick, secured by putty, but it must not fit too tightly, or it is apt to crack from the swelling of the wood. The best and neatest way of securing the windows is by a sliding shutter of zinc. Round the window there must be a projecting moulding, mitred at the corners; on one side the piece of moulding is moveable, and to the back of this is screwed a plate of sheet zinc; this passes in a rabbet to receive it, cut on the remaining three sides at the back of the lower edge of the moulding."

The communication between the boxes must be through openings at the bottom of each, about eight inches long and half an inch wide, which, when the hives are side by side, must correspond very exactly. A sheet of zinc, nearly the size of the side, forms the best divider to slip in between when communication is not desired. This may be lifted up sufficiently high to allow the bees to pass through the lower aperture into the side hive, but need not be entirely removed, as it serves to close the other opening at the top, similar to that at the bottom, the sole use of which is merely to introduce a knife to cut out the combs, which otherwise would be a matter of some difficulty.

Pieces of wood, three inches wide, should be screwed on to the front and back of one box, with sufficient projection to lap over the other box when they are placed side by side, so as to exclude the air and light, and keep them the more firmly together, (see *A*, Fig. 4). The boxes may be fastened to the boards by hooks and eyes, and they should be weighed

together, and the weight marked on each box, for it is very important to know this, as otherwise, in the autumn, there may be difficulty in ascertaining the exact amount of food left for winter supply. When painted, and well protected from the sun and rain, these boxes will last a very long time. The method of management of these boxes is the same in every respect as that we have recommended for the straw hives. The holes at the top serve either for capping or ventilation. It is not always proper to have the front doorway so wide as eight inches; that is only necessary in the busy season of honey-gathering, and even then the entrance should be closed at dusk, to keep out moths, which are great enemies of bees. In winter, also, you will sometimes require to close the doorway entirely, that the bees may not be tempted out when snow is on the ground, which if they do, they surely perish. The sunshine of winter sometimes deceives them, and attracts them from home, and the cold blasts destroy numbers ere they can return. In order to avoid these troubles, have some blocks made to fit exactly in the doorway after these patterns,

Figs 5

one of which is covered with perforated zinc, to serve in winter to prevent the bees from coming out, and in the summer evenings to keep moths from entering, and yet at the same time to admit air; the others are for the purpose of contracting the entrance as may be necessary: that with the single opening is for winter use, and the one with four holes for the early spring and autumn, when the bees are not so busy. If the hive be attacked by wasps, or by another stock

of bees, the pierced zinc block must be used as speedily as possible, to shut out the aggressors, when the bees within will most probably be able to conquer those already entered. In the *Bee-Keeper's Manual*, one of the best works for the amateur apiarian, Taylor recommends that the doorway of the box *B* should be made behind instead of the front, and that when it is desired that the bees should commence working in that box, that they should be turned completely round, the front of the one then to occupy the place of the back of the other. The doorway of the full hive at the back is then to be stopped, and that of the empty one in front to be opened. The bees will then find their entrance at the usual place. We have not ourselves tried this plan of reversing the hives, but see no reason why it should not answer very well, for as bees always return to the spot to which they have been accustomed, it is better when the new doorway is opened, that it should stand exactly over the place where they used to enter. To accomplish this, when straw hives are used, it is customary to have the stool on which the bottom boards are placed as long as three of the boards would occupy. The doorway of the hive *a* (Fig. 2), is exactly over the middle of the stool in front, while the bees are working in that hive only; but when they are required to work in the other, the entrance *b* will have to be placed just where *a* has been before, while *a* occupies the formerly empty space on the stool. The plan of reversing will only require the stool to be of the length of two boards, and therein presents an advantage.

NADIR HIVING.—A simple plan called *Nadir hiving*, or hiving downwards, is sometimes adopted with very good effect. Bees appear to have a strong desire to work downwards rather than in any other direction, so that in giving them room below we only follow nature, in which we cannot do wrong. There need not be much expense connected with this method. A board may be put on a common butter tub, and fastened down to it; there must be two holes made

in the board, and the hive placed upon it shortly before swarming time. The bees, instead of leaving the hive in a swarm, will occupy the tub, and the temperature of this being lower than that of the hive, the queen will not descend, but remain above for breeding; and the honey and wax made in the tub will consequently be pure and of fine quality. J. W. Jeston, Esq., of Henley, states that with this contrivance he found twenty-six pounds of honey in the tub, besides what was in the hive for the bees to live on; so he took the honey in the tub for his use, and replaced it to be filled again.

PROFIT, &c.—We do not think it necessary to enter into the explanation of all the plans which have been devised for the purpose of bee-husbandry, as they are much more complicated than the methods we have shown; some are very expensive, and adapted only for those who follow the pursuit for recreation alone. We can confidently recommend the plans described as simple, inexpensive, and effective, and far more profitable than the old method. On this point one writer says:—"On the old plan of burning the bees, a cottager's stock is sometimes large, sometimes small. After a bad honey year, he is often tempted to burn many of his good old stocks, in order to make up by numbers the same quantity of honey which in better years he gets from few. Suppose he leaves three stocks, of which two stand the winter, and the next year turns out a very good bee year, he is then not ready to make the most of it, and of course only gets one-tenth of the honey which he would if he had twenty stocks, as he ought to have. Man has nothing to do with the weather, as I said before; and I am very glad of it, for I am sure it is managed bet-better as it is. All I can do is to show you how you may make the most of a good year, get a fair quantity of honey in a middling year, and not lose all your bees (as many people do) in a bad one. It is found that in ten years four are very bad years, four middling years, and two very good, when almost any

quantity of honey may be got on a good plan. Two hundred and ninety pounds have been taken from one stock wtihout hurting the bees, while the heaviest cottage-hive I ever heard of was under 100lbs. If I, with ten stocks, get 60 lbs. of honey from each, which I easily can without destroying one of my stocks, am I not better off at the end of the year than you, whose ten stocks have all swarmed, and who, when you take up all the swarms in the autumn, think yourselves well off if you get 20 lbs. from each. You get 200 lbs. I get 600 lbs. of honey." Mr. Nutt, too, states that in one season, from May 27th to June 13th, he obtained 183 lbs. of honey from one stock of bees. Now if we take the value of this honey to be but one shilling per pound, we have £9 for the 183 lbs. of honey. But fine honey is really worth double this value, so that a cottager possessing two or three stocks of bees may, by proper management, fully realise the amount of profit we set down in our first chapter. We must frankly confess that we have not ourselves realised such large results from our bees, nor have we taken honey from a side-box earlier than June 10th; yet we ought not to doubt the accuracy of Mr. Nutt's statement, and we feel sure that any person who faithfully follows our methods, attending strictly to *ventilation*, will be well rewarded for his trouble.

CHAPTER IV.

ON THE UNION OF SWARMS AND STOCKS.

THE question is frequently asked by the defenders of the old system of bee-management, "But if we prevent swarming, by giving the bees room, how are we to keep up our stock?" To this we reply, "Keep a few stocks from which to obtain fresh swarms, but never take more than one swarm from each hive during the season." If a cast should come forth, the

readiest way of returning it to the parent stock is to take the bees when they are quietly hived, and suddenly dash them into a large tub or pan of water, placed just before the hive from which they came; then put a board sloping upwards from the tub to the mouth of the hive, take out the bees with a skimmer, lay them on the board, and as they dry in the sun, they will ascend to their old habitation, apparently none the worse for their rough treatment. This is a plan we have frequently followed, and always with perfect success, and have generally been able to make the queen a prisoner in her upward march with her now discomfited guards to her former domicile.

There will be no difficulty in recognising the queen from her greater size and more taper body, as shown in the engraving on page 106. When we have not been successful in securing her majesty, no inconvenience has followed, for according to Huber, should a young queen return to the hive, she is speedily destroyed by the reigning monarch. "The cluster of bees that surround her having allowed her some freedom, she seemed to advance towards that part of the comb where her rival stood; then all receded before her, the multitude of workers separating the two adversaries gradually dispersed, until only two remained, these two removed, and allowed the queens to come in sight. At this moment the reigning queen rushed on the stranger with her teeth, seized her near the origin of the wing, and succeeded in fixing her against the comb without any possibility of motion or resistance; next, curving her body, she pierced her unhappy victim with a mortal wound."

It will be frequently found in the autumn, that some of your stocks which have swarmed, or some of your new swarms are too weak to stand the winter. This will especially be the case after a cold wet summer, or otherwise bad honey year. Instead, however, of doing as you would formerly have done, by taking up these light hives, and smothering the bees with brimstone, let the injunction before given weigh upon

your minds, NEVER KILL YOUR BEES, for there is not the slightest necessity for continuing that barbarous practice, as you may take the honey and yet do some good beside, by uniting your weak stocks of bees to stronger ones, by the method we shall now describe. The hives should be first weighed, and those which do not weigh as much as 20 lbs. should be selected for deprivation. "You may find in damp meadows," says Cotton, "a fungus which children call 'frog's cheese,' and 'puff balls.' When quite ripe, if you pinch them, a dirty powder, like smoke, will come out. Pick them when half ripe, put them in a bag, and when you have squeezed them to half the size, dry them in an oven or before the fire. The fungus is fit for use when it will hold fire like tinder; keep this dry till the time you take your bees."

There is another kind of fungus found growing in vaults or cellars, which burns without previous drying, and will answer the required purpose as well as the other; or rags soaked in a weak solution of saltpetre in water and then dried will do. We have sometimes used common blotting-paper in the absence of other materials. "A round box made of thick tin, without any solder, must be provided. This box must be about two inches in diameter, and an inch and a half deep, with a conical moveable top, about an inch and a half high, perforated with holes." There must also be some holes at the bottom, to admit air, and it must be supported on legs made of wire, as shown in the cut.

This box, and a piece of the fungus lighted within it, must be put into an empty hive, turned upside down. The full hive which you wish to take must then be placed upon it, and a wet cloth thrown over all, to prevent either the bees or the smoke from escaping. In a few minutes you will hear the bees dropping into the lower hive, and the upper one may then be tapped gently, to make them

fall quicker. When all is still, lift off the hive, and you will see the bees lying apparently dead below, "as if they had been burned with brimstone; but the fungus does them no harm; it only makes them drunk, which is very good for bees, though bad for men, as they get well in twenty minutes, have no headache next morning, and are all the merrier afterwards, and it was not their fault that they were so *overtaken*. Look for the queen bee; nine times out of ten she does not fall down, but holds fast to the top of the hive, in the very middle." Supposing you cannot find her among the stupid bees, proceed to cut out the comb, and you will most likely discover her in the centre comb at the very top. Place her under a glass with a small bit of honey-comb, keep her as long as she will live, as if any accident deprives a hive of its queen, you may substitute this one in her place. Then sprinkle the intoxicated bees with honey or syrup made of sugar boiled in ale. The hive to which you intend to unite them must then be placed upon that in which they are lying stupefied, in the same manner as the hive was from which they have just fallen. The bees in the upper hive, attracted by the scent of the honey, soon begin to descend, and to clean the sprinkled bees with their tongues. Their helping them in their troubles makes them friends, they soon become mingled together, and ascend with their companions to the hive above. They must be left quiet all night, and in the morning may be placed on the board in their former position. In a day or two another addition may be made to the hive in a similar way, if required. "The most wonderful thing is this,—that A DOUBLED HIVE WILL EAT NO MORE HONEY IN WINTER THAN A SINGLE ONE. The reason of it seems to be, that where there are many bees in a hive, they can keep warm by keeping close together, instead of eating; so that in a full hive, the same quantity of honey goes further than in a weak one, as each bee eats less. They keep themselves warm from the outside, and so do not require

to be heated from the inside; as a man who, by keeping bees, or any other honest way can have a good coat on his back, is warm enough without a brandy bottle." Another way of uniting stocks is by having the tin box fitted to a pair of bellows and adapted with a tube instead of a conical top. Late in the evening, a piece of lighted fungus being put into the box, introduce the tube into the mouth of the hive which you intend to take, blow gently with the bellows until the bees fall down upon the board. Perform the same operation to the hive to which they are to be united. After taking away the queen from the first hive, sweep the bees carefully on to the cluster which has just dropped from the other, and after well intermingling them, sprinkle them plentifully with syrup. Support the hive on edge, over the heap of bees, that they may not be crushed, and by the morning they will have become friends and gone up into the hive which may then be lowered to its proper position. In this way you may unite and strengthen your stocks without the loss of a single bee, and in the ensuing spring you will reap the reward of your mercy in the honied stores your little labourers will treasure up for you. The same methods may be adopted for uniting swarms and casts in summer, while there is yet time for honey-gathering, but nothing but the union of weak swarms with strong ones must be attempted in the autumn.

CHAPTER V.

DEFENCE OF THE NEW METHOD—FEEDING—WINTER MANAGEMENT—CONCLUSION.

We trust that by this time all who have read the preceding chapters are convinced that killing the bees by suffocation is the very worst plan they can adopt;

there is not only a positive loss, but the honey is injuriously discoloured and ill-flavoured, while the trouble is quite as great as by the fumigating method. Yet, although full proof has been given of these advantages, the proposition to effect a change in the old-fashioned ways to which men are accustomed, is received by some with distrust, by others with ridicule.

"Our fathers and grandfathers did so, and why should not we?" is a very frequent reply, when we venture to suggest the exchange of a cruel and wasteful system for the merciful and profitable plan we propose. Nor are there wanting men of education and talent to conspire against the poor bees, and consequently against the interests of cottagers. One observes, "we find special *good cause* for the slaughter of lambs and calves, and of every thing which it appears to be our *interest* to kill; and therein we follow a primary law of universal nature. Since drones are murdered, why not murder their murderers?" This appears to be as reasonable as to say, "Let us murder the butcher who kills our sheep." We do not slaughter sheep for the sake of their wool, as we can deprive them of it without; and by the same rule, there is no reason for the annual murder of thousands of bees, as we can take their honey while we preserve their lives. It is, therefore, our *interest* not to kill the bees, but to preserve them for future profit. It is useless to urge Cobbett's plea, "the bees will all die of old age if you do not destroy them," for in the autumn there are no *old bees*, they gradually disappear at the close of the season and those which remain are mostly, or perhaps altogether, of that year's brood. "What can now be urged in extenuation of a wanton waste of valuable life? The plea of necessity no longer avails as an excuse for what henceforth becomes an act of deliberate folly,—perhaps I might say wickedness,—that of killing bees. It is the golden goose acted on a large scale, only in this case, the murdering bee-master is himself a very sorry goose."

FEEDING.—In a late spring, when the bees are unable to go abroad to gather honey, it is very desirable that they should be fed, as their winter store is nearly exhausted; and if this be the case, unless you supply them they must perish. Do not be sparing or stingy, but afford them a liberal provision, and by-and-by they will shew you that they have not wasted your bounty, for as soon as honey-gathering commences, they are prepared in strength and vigour to—

"Gather honey all the day
From every opening flower;"

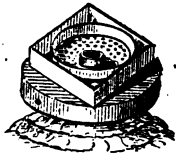
and you will reap your harvest earlier and more abundantly.

People sometimes wonder how it is that their bees die in the summer; this very often happens in hot dry weather, when the flowers afford no honey, and there is no supply for the young brood, and the *nurses* are obliged to cast out from the hives the grubs which perish thus by thousands. A little timely feeding at such a season would preserve their lives for your benefit hereafter.

Feed your swarms for a day or two after they are hived, if the weather be bad; or even if it be fine, it helps them at that period. Autumn-feeding should not take place later than September, and then all the stocks which do not weight 20 lbs., which you intend to preserve, must have sufficient food given them to make up that weight. Recollect that "nothing you give your bees is thrown away; all is repaid with interest. Not a single ounce of honey has ever been wasted by bees since the world was made." Feeding outside the hive, by placing their food at the entrance, is a bad method, as stranger bees are attracted, which deprive your bees of a large proportion of that which you have provided for them. Feeding at the bottom disturbs the bees, lowers the temperature of the hive when the food is introduced, and in cold weather often occasions the loss of many lives. In order to

obviate these evils, feeding-pans have been invented, by which to supply the food at the top of the hive; and of these, we have preferred to use that described by Taylor, as follows:—

"I use a tin or zinc pan, seven or eight inches square, and one inch and a quarter deep, having a circular two-inch hole in the middle of the bottom, with a rim round it standing up half an inch. Another circular rim or partition, as large in diameter as the square of the pan will admit, is soldered down within it at the four points where it touches the sides. It must not go down to the bottom, but a space must there be left of about an eighth of an inch, as a passage for the food, which is poured in at the four angles.



A perforated thin wooden bottom or float is fitted loosely into the pan between the circles under which, when slightly raised, the liquid flows. A cover is made by a piece of glass, resting on the larger circle, but cut nearly octagonal in form, so as to leave the corners open. The circle on which the glass rests should be an eighth of an inch lower than the outer rim."

This pan is to be supplied either with liquid honey or syrup of sugar boiled in ale, and be placed on the board at the top of the hive, (Fig. 3.) The bees will come up through the large hole in the centre, and suck up their food through the small holes in the thin float of wood. To keep out the light, the pan should be covered with a board, which may be lifted off when you wish to see how the bees feed. When the pan is to be removed, you must slip a piece of zinc under it, to cover the hole, as the bees would come out very angry if you were to take it away without that precaution.

WINTER MANAGEMENT.—For the preservation of

bees during winter, Mr. Cotton's plan is usful. "In damp places," he says, "many bees die of the rot. Even in dry places, a good deal of water settles on the top of the hives inside, made by the breath of the bees. To prevent this from harming them during the winter, take the bung out of the hole at the top, and put a tin on the board on which the cap stood in the summer. It is an upright ring standing on a flat plate of tin, or zinc, with a hole through the middle. Over this turn a glass topsy-turvy. The hot air comes up through the hole, turns into steam, and runs down the glass outside the upright ring.

"The best place for bees in winter is *a dry, cold, and dark room, or out-house.*

"Put your bees there the last week of November, and let them sleep quietly till the flowers begin to come out at the end of February. Set their bottom-board slanting, that all the wet may run out at the door; or, still better, hang them up in a coarse cloth. This will let in the air, and let out the water. In the spring you will find the bees kept in this way much stronger, as well as heavier than any you leave on their summer stands. If you have no such room or out-house, at least keep the sun away from them, or put them on the north side of your house, if the place is dry."

We trust that enough has now been said of the advantages of bee-keeping, to induce many cottagers to TRY if they cannot greatly improve their lot in life by the labours of the "little busy bee," everything connected with which seems fraught with profit; not only the wax and honey, but the very refuse of the comb, from which the wax has been taken, is of some use. "In God's world," says the Rev. Mr. Kritz, "there is nothing useless, and every thing can be applied to some particular purpose. When the keeper of bees has pressed out his wax, a refuse is left which is not wax, this is made up into balls, and sold to the proprietors of the great wax presses, who, when they

have extracted from it the last particle of wax, manure their cucumber beds with it, and this is the cause of their celebrity in producing the finest cucumbers in the country. This circumstance having been mentioned to me, I determined this year to make the experiment on a small scale. I did not dispose of the refuse of my wax, but as soon as my cucumbers had put forth their third leaf, I crumbled my wax balls as fine as possible, removed the upper soil from every plant without disturbing the roots, and having sprinkled the wax refuse over it, replaced the mould. The result far exceeded my expectations. Never before did I raise such beautiful cucumbers, nor in such profusion."

With all the advantages we have mentioned, who would not keep bees? They may be kept almost anywhere, except in large cities. In the neighbourhood of rural towns there are usually large gardens abounding with flowers in the early spring, which afford a plentiful supply of bee-food, when the fields and trees, from which the principal stores are derived, are yet bare and unproductive. Those who live in such situations should avail themselves of our directions; but the cottager especially may employ his leisure, add to his pleasures, and increase his comforts by attention to these suggestions.

All cottagers would do well to consider the emphatic words of an author who has interested himself very much on their behalf. LEARN FROM THE BEE TO WORK HARD AND WASTE NOTHING. REMEMBER NOTHING WORTH DOING CAN BE DONE WITHOUT A LITTLE TROUBLE; AND, ABOVE ALL, HELP EACH OTHER ALL YOU CAN.

GOD SAVE THE QUEEN.

DIRECTIONS TO BEE-KEEPERS.

JANUARY.

DURING the first month of the year, and in all the winter months, bees require very little attention, indeed nothing more is necessary than to keep them dry, and sheltered from the sun. *Cold* will not injure them, but *damp* kills them.

Attend to the instructions given for winter management at page 130.

Hives and boxes may now be made ready for the ensuing season.

FEBRUARY.

IF your hives have been placed in winter-quarters, and the weather prove mild and open, now remove them to their summer stands. If on the contrary it be wet, snowy, cold, or otherwise unpropitious, you had better keep them sheltered as you have done through the winter. Perhaps the safest guide, as to the time when bees may be allowed to go abroad, is when the crocus and other early spring-flowers put forth their blossoms, as this time varies in different situations, according as we approach the northern or southern portions of the kingdom.

Before settling the hives for the summer, weigh them, and note down the weights in a book; you will see by this what quantity has been consumed through the winter, and also be able to tell what feeding they will require if the spring be backward.

We do not, however, advise feeding yet, as—until all probability of frost and snow be past—it would be injurious to excite the bees, as they would fly abroad,

where they would prematurely perish; thus diminishing the heat of the hive, which should be preserved as much as possible, in order to facilitate the hatching of the young brood, which now begins to make its appearance.

Keep the entrance to the hive nearly closed, let it be only wide enough for one bee to pass at a time.

This is the best month in the year for purchasing stocks. The bees have lived through the winter, so that you do not run the risk of losing them, as you might have done by buying them in the autumn. You may judge if a stock be a good one, and in a healthy prosperous condition, by observing, on a fine day, whether many or few bees enter the hive with little golden-looking pellets or balls on their hind legs. This is the farina of flowers, or *bee-bread*, as it is called, which is now collected by the bees for the nourishment of the young, and forms their principal labour at this season. If you see as many as twenty or thirty every minute going in so laden, you may judge the stock is prospering, and regulate your purchase accordingly.

Hives should not be generally removed later than the end of this month, as the bees do not readily take to a new situation when the spring is more advanced.

To Carry a Hive.—Let it be placed on a cloth, the ends of which must be carefully tied over the top; if it is to be taken to a distance, the hive so tied up may be swung on a pole, fastened across a cart from side to side; this prevents the jolting to which it might otherwise be subject, which would disturb the bees, and probably shake down the comb. When arrived at its destination, let the hive be placed on the stand, and if any of the bees have fallen out on the cloth, place them near the entrance, and they will soon find their way in.

MARCH.

As soon as the weather is fine, the hives which stood in the open air during the winter should be examined.

Lift them carefully from the stand. Clear away all the dead bees and refuse matters which have collected during the winter. Rub the mouldiness and damp from the floor-board, and let it be well dried. The bottoms of the combs often become mouldy in the winter, especially in light stocks, and it will be a good thing to cut off the lower portions, which may be done with a table-knife, and without danger, by turning the hive on one side, in the evening or early in the morning, or at any time, if you take the precaution of smoking a pipe during the operation. The bees will soon restore the combs, and their health be improved by the removal of the decayed portion.

Let straw hackles be removed, in which mice often lodge themselves, working their way into the hives and destroying them, but do not leave the hives without protection; cover them with something that will keep off the rain. Do not yet enlarge the entrance, unless for a part of the day when the weather is *very* fine, when it may be opened wide enough for two or three bees to pass together.

Begin to feed the *light stocks;* do not be sparing; a liberal supply will be amply repaid by the health and vigour of your bees *now*, and by the abundant store they will lay up hereafter. Read the remarks on this point at page 128, where directions for feeding have been given. Guard against the admission of stranger bees while yours are feeding. Give *honey* now, if you can, rather than syrup, as it forms a better ingredient than sugar in the jelly which supports the young brood.

The consumption of food in a hive is now perhaps greater than at any period of the year. The queen lays from 100 to 200 eggs daily, and the increase of the brood is so rapid and prodigious, that it is impossible for any except a well stored hive to stand the trial. Many persons wonder that their bees die in the spring, when they have survived the winter; but we have before shown that the food consumed during the cold weather is comparatively very small

to what it is during breeding time. On this ground, we desire to urge bee-keepers to feed abundantly *all their stocks*, but especially the light ones. "You do not waste your honey by feeding, but only, as it were, pour it out of one pot into another, where you may find it whenever you want it, and not only so, but you find a peck where you put a quart."

If you have room in your garden, sow borage and mignonette; the former is eagerly resorted to by bees; it is an annual, and blossoms all through the season till cut off by the frost. Mignonette is also a great favourite with bees, and yields honey of a fine flavour. Both these continue to blossom during the autumn, when many other flowers have disappeared.

APRIL.

THERE will be a great increase of activity in the hive this month. As the spring opens, flowering plants and fruit trees will be in bloom. On account of this increasing supply of food from abroad, there is the less necessity for feeding; yet it should not be entirely discontinued, particularly if the weather prove cold or wet.

Multitudes of bees will now be seen passing out of the hive, and returning richly laden with honey and farina. There will be great pushing and apparent confusion at the entrance, in consequence of the additional labours of the season; for this reason you must enlarge the mouth of the hive, but not yet to its full size.

It is not uncommon at this season to find a hive which exhibits none of this industry and activity. Bees, few in number, and to all appearance without any object, may occasionally be seen going out and in, or lazily buzzing before the hive. If there is no want of honey, the most probable cause of this inactivity is the death of the queen from some accident during the winter. The bees in such a case gradually forsake the hive and mostly perish, though some few

probably become united to other stocks. There seems to be no alternative, as soon as the loss of the queen is discovered, than to endeavour, by removing the hive to a dry place, to preserve the lives of as many of the bees as possible, in order to unite them with a late swarm, to which they will prove of considerable benefit.

Every thing necessary should be prepared *now* for the reception of swarms which may be expected during the next two months, then there will be no running hither and thither while the swarm takes wing and is lost through your delay. Hives or boxes, if you intend to make use of them, must be kept dry and sweet; stands or stools to place them on must be prepared. A hand brush, leather gloves, crape, or other covering for the face, must be placed in readiness; and all the apparatus we have described which you intend to adopt should be at hand; you will then be in readiness for whatever casualty may occur, and also for testing the value of the improved system of bee-keeping we have endeavoured to unfold.

As bees require water to drink, especially during this and next month, when the weather is warm and dry, it is necessary to place some for them, if there is no pond or rivulet near. Cotton says that in the Isle of Wight the people have a notion that every bee goes down to the sea to drink once a day. Water is needful for them in the breeding season, and they will drink water with salt in it, and like it better than the freshest brook that runs. It is very curious to see how they will flock by thousands to the drinking-troughs in April, May, and part of June; and then their thirst seems to be quenched all of a sudden, for not one will be seen at the drinking-trough. The reason seems to be that they do not want so much water after the greater part of the young brood is hatched.'

Shallow dishes or plates may be filled with water, having thin boards pierced with small holes placed to float on them, from which the bees may drink with-

out fear of drowning. Small pebbles, or moss, placed in the plates with the water, will answer almost as well.

MAY.

Our instructions for this month will be to those who keep bees in common hives for the purpose of swarming, as well as to those who have adopted the method of preventing swarming in order to procure honey.

Bees usually swarm in the months of May and June, sometimes a little earlier or later. The most valuable swarms are those which come at the end of this, or the beginning of next month. The earlier part of May is often cold and wet, the bees are hindered from honey gathering, and unless fed, would decrease in strength very much, and perhaps eventually perish.

The chief indication of swarming being about to take place is the gathering of the bees at the entrance of the hive, where they cling to each other, and hang in a cluster under the board. This clustering is evidently the natural instinct of the bees, which leads them to gather together in the same manner as when they are making comb within the hive; and as the hive is now quite full, they are under the necessity of remaining in idleness until the time the queen may be ready to accompany them, to form a new colony. Sometimes they will hang out for a fortnight, or even a month before they swarm. That swarming is an act of *necessity*, not of *choice*, is evident from the fact that they often begin to construct their combs under the hive board.

It would be a pity to allow these bees to be thus idle in a fine season, when they are quite willing to work; they will lay up a small store of honey for you if you will provide a way for them. For this purpose, if you have a hole at the top of the hive, take out the bung which closes it, and place upon it a small hive or cap, which will contain about eight or ten pounds. There should be a little window in this

small hive, so that you may be able to see when it is full. Very often such a cap will be filled in a week, and the bees will not be prevented from swarming one day later than they would have done if they had all been hanging out in idleness. If the cap be *too large*, the queen will very likely go into it, and when you remove it you will find maggots and young brood instead of only pure virgin honey. (To take off the cap when filled, see page 115.)

Clustering is not the only sign of an approaching swarm. The appearance of the drones about the middle of the day; a kind of hum, a shrill piping sound in the hive in the evening, and the restlessness of the bees are also indications; and generally when on a fine morning very few bees are at work, while on the day before all was activity and bustle, it is pretty certain that the swarm will rise in the course of the day. But sometimes they swarm without any notice, so it is better to have some one to watch on fine days, from about nine in the morning till three o'clock, so that it may be known immediately when a swarm has gone off.

No one need be afraid of bees when they swarm; they appear to be fearful themselves at that time, and are usually so peaceable, that we have often taken up a handful without being stung. But as all persons have not courage, it is much safer to have gloves on, and the head and neck covered with a hood of gauze, crape, or thin linen; and thus protected, any one may venture to hive bees with impunity. Throwing dust or water among them during their flight is often injurious; and *music!* from your warming-pan and door-key, or your tongs and shovel, is of no manner of use, and may hinder you from attending to something necessary to be done. If possible, get a person who is accustomed to it, to hive the swarm, but if not, attend to the following directions:—

If the swarm is to be put in a straw hive, let it be a *new one*. Lose no time as soon as your swarm is settled, or they may be off again, and you will proba-

bly *lose* them. Spread a table-cloth or a sheet on the ground under the swarm. Place the hive-board upon it. Let one person hold the hive turned upside down close under the swarm, while another gives the bough a sudden shake, so as to jerk off the whole mass of bees into the hive, which must then be turned down upon the cloth, one edge being a little raised by a stone or bit of wood, that the bees may not be crushed. If the swarm be hanging upon a small branch, it may be cut off with a sharp knife or a pair of shears, and let fall into the hive. When on the thick branch of a tree, there will be more difficulty. In this case hold the hive under as before, and sweep the bees into it as carefully as possible with a soft hand-brush. If the queen be swept into the hive, the bees will soon follow. Should it happen that they swarm high up in a tree, these directions must be followed as nearly as possible by persons mounted on ladders.

This swarming is necessary in order to increase or keep up your stocks, but of course it should only be allowed from hives kept on purpose, as the new system is intended to prevent swarming, in order to procure a plentiful supply of honey from the increased population.

Never on any account hive a *cast* with the intention of keeping it by itself through the winter, or for taking up in the autumn, rather return it to the parent hive (see p. 123) or unite it to one of the earlier swarms, so as to make a strong stock. Unless the year be unusually favourable, casts never do any good, while the old stock is often so weakened by the loss, as to be almost worthless in the autumn, or for preserving through the winter.

If unfavourable weather ensues shortly after the swarm be hived, *feed the bees*, it will strengthen them and prove a gain to you in the end, (p. 128.)

The entrance into the hive should now be enlarged to its full size, that the bees may have abundant room in the busy season of honey-gathering. Side-boxes

may be opened; they need not be ventilated for two or three days until the bees have well taken to them and begun to form comb; after this, however, great care must be taken to ventilate well, in order to keep them cool. Give plenty of water, but so as the bees may not drown themselves. Shade the hives from the burning sun, which makes them so hot that the bees can scarcely work, and sometimes melts the combs, causing them to fall down and smother the bees. Feeding old stocks need not be continued unless the weather be unusually unpropitious.

JUNE.

BEES kept in hives or boxes on the improved system must now have additional room given them, in order to prevent swarming, (see page 112.)

It is a good plan to keep a register, in order to see how long the bees are in filling the hive, and for comparison with future years. The following extracts from our calendar will shew the plan:—

1850.	HIVE No. 2.
May 22.	Opened right-hand side-box.
,, 26.	Bees commenced work in ditto.
,, 31.	Opened left-hand box. Bees immediately began labour.
June 12.	Took away right-hand box. Weight of honey, 12 lbs.

A daily register of the weather will also be very useful. Be careful to give room in time, and to take away the side hive as soon as filled, or the bees may swarm. If they do so return them to the parent stock by the plan recommended at page 123.

Weak stocks may be strengthened now by having casts joined to them, either by the method given at page 123, or in the following manner:—On the evening of the day the cast is hived, as soon as the bees are all quiet, turn up the hive, and sprinkle the bees with syrup; then suddenly shake them out altogether upon a table; place the stock to which they are to be

united above the mass of bees, and support it that none may be crushed; they will very soon become one stock. Late that night, or very early next morning, the hive must be placed where it is to remain. Many bee-keepers adopt this method with success. Casts may be joined together in the same manner so as to form a strong stock, instead of two or more worthless ones.

JULY.

THE combs in hives that have stood for several years become black and useless, because the bees never clean out the cells in which the brood has been reared, and the skins which the young bees cast gradually fill up the cells until they are too small for breeding. In consequence, the hives get weaker and weaker, swarming cannot take place, and at last the bees die.

To prevent this fatal end, you may in spring, before breeding-time commences, after fumigating the bees a little, turn up the hive, and cut out half the comb; put the bees in again, and during the summer they will fill up the vacancy, amd have room for breeding. Next spring take out the remainder of the old comb in the same way. One stock, treated in this manner, is said to have been kept for the long period of sixty years. Sometimes when a stock has not swarmed, it is desirable to remove the bees altogether from the old hive into a new one. This must only be done during the first week in July; if attempted earlier, the new brood not being all hatched, may bee grubs would be destroyed, and you would have a weak stock. On the other hand, if transferred later, there would not be time for them to make their comb, and lay up winter store. Fumigate at night, as described (page 124), put the stupefied bees into a new hive, taking care that the queen is among them; place the hive on the stand in the same position the old one occupied, and on the morrow they will commence their labour as a new swarm. If the weather be fine they will do well, but if they are found to be

weak in autumn, take them up and unite them with another stock.

Driving bees is sometimes adopted, instead of fumigating. The operation is as follows:—Put the new hive upside down in a pail or pan, put the old hive carefully upon it, tie a cloth round to keep the hives together, and to prevent any bees from escaping. Turn the hives up, so that the old one may be at the bottom, the new one above. Tap gently with a stick round and round the old hive until the bees ascend to the new one. As soon as they appear to have gone up, put the new hive on the stand in place of the old one. If the queen is in the new hive, the bees left in the old one will soon rejoin her, if the old hive be placed near. This method is best practised in the evening.

Now take side hives and boxes when they are filled, as directed, (page 123). Prevent swarming in July; late swarms never do any good.

AUGUST.

On the Continent, and in some parts of our own country, it is usual to take bees to different places in order that as food fails in one part, they may find a supply in another. Cotton says, 'In France they put their hives into a boat, some hundreds together, which floats down the stream by night, and stops by day. The bees go out in the morning, return in the evening, and when they are all back and quiet, on the boat floats. I should like to see this tried on the Thames, for no river has more bee food near its banks;—willows, the best bee food in spring; meadows, clover, beans, and lime trees, in different places and times, for summer. A hardy man who could make his own boxes, though not up to hard work, might, I am pretty sure, gather, *through the mouths of his many thousand bees enough to fill his own one mouth*, though it be somewhat larger. He might float softly *down* the river, as the flowers go off at

one place and come on at another; and any bargeman would be glad, for the small price of one pound of Thames honey, to give him a tow *up*, when he wants to go back. I should like to see it tried!'

In Yorkshire it is a common thing for cottagers who live near the moors to be entrusted with the hives of other persons who have not this advantage. They charge about a shilling for each hive; and during the months of August and September, these bees have a good honey gathering from the heather then in bloom, and are afterwards returned to their owners who reap a good profit from the visit their bees have made.

Whoever has the opportunity, will do well to send his bees to the neighbourhood of heaths at this season. This is the great honey harvest month for you. Let us again urge the merciful recommendation—DO NOT KILL YOUR BEES—do not take the honey by suffocating with brimstone. Fumigate with the fungus or other substances as we have recommended, and unite the bees to strong stocks to stand the winter. Thus you get the honey, and yet save your bees. Now contract the entrance of the hives, to guard against robbers.

SEPTEMBER.

THIS month is the proper time for carefully inspecting your stocks, to ascertain which will stand the winter; for feeding those which have not sufficient food, and for uniting weak stocks to strong ones, as recommended, (page 123).

By gently striking the hives, you may judge whether they contain many or few bees by the greater or lesser noise they make in the buzzing which immediately follows. Do not leave any to remain the winter but such as weigh about 20 lbs. But recollect that a hive with 2000 bees will be more likely to survive than one with only 1000, even if the latter have much more honey. On this account it is important to ascertain the number of bees, and to make your standing stocks as strong as possible.

Whatever food is required must be given *now*, as bees should not on any account be fed in winter. Those who have not the convenience of the feeding pans for the top of the hive, should provide little hollow troughs made of elder, or a split bamboo, stopped at the ends. These must be filled with honey or syrup, and be pushed in at the mouth of the hive at sunset, and the entrance carefully closed to prevent other bees from entering. Feeding should not take place in the day-time, as the hive will then be subject to the depredations of wasps and robber bees, which are attracted by the scent, and not unfrequently devour the whole of the honey. In the morning, a little before sunrise, remove the troughs. Continue this operation nightly until you are sure your bees have sufficient winter provision. Do not be stingy: as we have said before, by-and-by you will reap the profit of liberality to your bees.

As some persons profess to have a difficulty in procuring the fumigating fungus, we may just say that the substance called German tinder, used by cigar smokers, or tobacco leaves wrapped in brown paper, will answer almost as well.

Do not be too ready to suppose your bees are dead, as some people have done, after using saltpetre rags, or even the fungus. If kept exposed to the cold after fumigation, they will surely die, but in a warm room there is no danger of this. If they appear to you to have had an over-dose, and you find many apparently dead on the following morning, they may be recovered by placing them in the sun, or by the gradual application of warmth. After being drowned for twenty-four hours, and dried and warmed in the sun, bees will recover; nay, more, even the fumes of the brimstone does not always *kill* them; and it was by the reviving of some smothered in this manner, that the *merciful* plan was thought of.

If any drones are observed about the mouth of the hives as late in the season as the present month, it is more than probable that some defect exists within;

and it would be well to select such stocks for union with others.

Close the entrance of your hives, only leaving room for one bee to pass at a time. Protect them from the weather: a good straw hackle may do very well for the winter, but a red pan turned down upon the hive is better.

It is *damp*, not *cold*, which kills bees. Use the most effectual means for guarding against all moisture, if you wish your bees to be preserved.

DIRECTIONS FOR EXTRACTING THE HONEY AND WAX FROM THE COMBS.—Remove your combs into a room where the bees cannot enter, otherwise so many will be attracted by the scent, as to interfere with your operations. Clean the combs carefully from all refuse, then cut them in slices, and lay them on wires or small sticks placed over a pan that they may drain. The honey which runs in this manner is the best. After all the honey that will flow has come away, wrap the combs in a clean cloth, and squeeze out as much as possible into another pan. This honey will be of an inferior quality to the other. The combs, cloths, and other materials used in the separation, may then be placed near your hives, and the bees will carefully collect all that remains.

Afterwards put the combs into a clean saucepan, with as much *soft* water as may be necessary to prevent the wax from burning. Place the saucepan over a slow fire, and stir occasionally until the wax is quite melted. Strain through a fine canvass bag into a tub of cold water. You will have to squeeze the bag between two boards to force the wax through; it will fall into the water, and form thin flakes on the surface. Then collect the wax, put it again into the saucepan made quite clean, with a little water, melt it again very carefully over a slow fire as before, and take off the scum as it rises. When sufficiently melted, pour into *wetted* saucers or other moulds, and set it by, where it may cool *very* slowly, or it will be full of cracks.

OCTOBER.

This month it will be advisable to ascertain if your stocks have sufficient food for winter; if they have not, still continue to feed them as they require, and the weather permits.

Guard against *dampness*; it is this more than all else that will destroy your bees. The damp of the weather *outside* the hive may be kept away by suitable protection, but it is the damp *inside*, caused by the condensation of the moisture from the breath of the bees, which does the mischief. Just as the wet collects and trickles down the walls or windows of a room in which a number of persons are assembled, so does it form in a hive, and more so in winter when there is but little evaporation.

An equal temperature within and without the hive would best prevent condensation. Do not think, therefore, of keeping your bees warm, but attend to the directions we have given for winter management (page 130).

Nothing more need be done until February: leave the bees alone, keep the sun from them, and prepare hives, boxes, and the necessary materials for next year.

FARM & GARDEN PLANTS.

THE POTATO.

THE potato, which is generally supposed to be a native of Chili, was taken, according to Baron Humboldt's theory, from that part of South America to Virginia, by some of the English colonists who settled in North America towards the latter part of the 16th century, or carried by them from the West Indies (where the Spaniards had cultivated them) by which track they were in the practice of navigating to their settlements in order to profit by the trade winds. Spaniards had previously introduced the potato (the natives of Columbia called it *papas*) from South America into Southern Europe, where it was first known under the Indian name of *battata*, which by a slight alteration becomes *potato*, under which established designation may it long continue to flourish in our land!

Sir Walter Raleigh, the founder of the Virginian colony, had the honour of first cultivating this noble vegetable at Youghal, in Ireland. But the first attempt of the gardener, who had planted some tubers of the "fine American fruit" in his master's garden was a failure. The man very naturally supposed that the apples which the flowers produced in autumn were

the eatable portion; having tasted them, and of course condemned them as very unpalatable, he received permission to throw the "worthless weed" away. The discovery of about a bushel of tubers underground led to the experiment of cooking them; thus their utility and excellence became known, and from that small stock, all our varieties may have multiplied.

In the reign of James I., potatoes—then only raised in gardens—were sold for 2s. a pound. When their culture became established in Ireland, importations of them reached Lancashire, which has been deservedly distinguished for the fine varieties produced there. The Scotch did not become acquainted with the value and right use of the potato until about the year 1730. It was not even then cultivated in the open fields; and so great a luxury was a roasted one considered by schoolboys, that they used, even at a later day, to lock them up in trunks or boxes, for the purpose of a feast.

In the present time, since the late inexplicable disease which affected them has in a great degree passed away, potatoes occupy a large area of the cultivated lands of Ireland, Scotland, Belgium, Poland, Germany, and some other parts of the European continent; and in the cottage and market gardens of England, they are rapidly increasing in extension. No vegetable has been more extravagantly lauded or abused; but the truth seems to be, that as a general element of food for the labouring people, the potato, if in a dry, sound state (otherwise it is noxious) is highly valuable, but that it ought never to be their exclusive food. Corn bread, or porridge of some sort, is necessary to form and strengthen the muscular parts of the body.

If the potato be compared with the turnip as food for either man or beast, it has, weight for weight, a decided superiority, because it contains much less water, and is rich in farina (starch), of which the turnip has none. This fattening quality of the potato is so well known by cattle-feeders, that the quantity

of potatoes given as a feed to a beast is considerably less than that of turnips.

Yet it should be observed that some modern chemists deny the importance of starch as a source of nourishment. If, according to the old notion, starch be a right standard of nutritiveness, potatoes would rank after oats, and before rye, peas and beans; but if according to modern opinion, what are termed the nitrogenous principles, (of which gluten is one), be the standard test, grain crops and beans and peas would head the list. If substances which produce muscle be the standard, potatoes would hold an extremely low place. As the fact is unquestionable that millions of finely formed and healthy men, women, and children, live almost entirely on a potato diet, we cannot well doubt that potatoes possess some compound elements which tend to build up and support the animal frame.

Potatoes are rarely raised from seed except for amusement, or in the expectation of producing some new variety of a prime sort. Some hybrid sorts, such as the cup, though they blossom, do not yield seed apples, and some of the early varieties do not blossom at all. The small tubers which the seed of one season produces, are usually planted out in the next in rows or drills about fifteen inches apart; but it will appear from the interesting report of M. Lander, a foreigner, read before the British Association, that full grown potatoes are producible from seed sown in the same year. The gentleman here referred to had raised them in the same manner during many years, and never had less than 24 sacks from half an ounce of seed. "The seed is saved in the following manner:—the berries should be gathered in autumn, before the frost sets in, and be preserved in a dry place, where frost cannot reach them, until the end of January, when the berries should be broken by the hand and placed in a tub or other vessel for six or eight days to ferment: water should then be thrown on them and well stirred, in order to separate the

pulp and husks from the seed, which should then be dried and cleared, and kept in a warm dry place until the middle of March. In the middle of March or beginning of April,* the seed should be thinly sown in a hotbed, and by the middle of May there will be fine healthy plants which may be put out into the field; care must be taken to put them out before they form tubers, and the seed beds should be kept moderately moist while they remain in it. They should be planted out after rain, and be put at about the same distance from one another as potatoes generally stand in the field."

The objections to this mode of propagating potatoes too frequently, are, that the seed may sport into endless varieties, and produce among them many bad sorts, and that confusion in the sorting may occasion much trouble; and moreover, that more firm, mealy, and large-sized tubers are likely to arise by propagating from strong healthy *tubers* than by the more tedious process of seed sowing. Even though M. Lander's method be quite practicable, the first crop would consist of only soft, waxy, and therefore uneatable tubers, in most instances. However, as seedlings are more vigorous than the old parents from which they have arisen, the raising of seedling potatoes should, indeed, be more frequent than it has been, if it were only in the hope of obtaining a progeny sufficiently vigorous to resist the morbific influences which have blighted the old stock.

The best varieties of the potato will, however, degenerate after a certain course of years, and therefore propagation by seed is to be encouraged. We have to mourn that a red-apple variety, on which we feasted during many years, has departed without leaving its like behind: for mealiness, flavour, and long-keeping it was unrivalled, though it could not boast of being very prolific, or suited to inferior soil

* The seed is generally sown in pans, which are placed in the hotbed, and may be removed conveniently.

and bad treatment. Varieties of the potato are endless, and every season produces some new ones. It is useless to enumerate here more than a few of acknowledged excellence for early and late use.

Among the very early kinds (which do not blossom) may be mentioned the early champion, early American, and the early ash-leaved; none of these, however, are suited to the cottager, unless he cultivates for the market, as they are not mealy or prolific. For a later and more abundant supply, the early Shaw, the early champion (again), long red and white kidney, walnut leaved, Scotch pink eye, forty fold, and Cumberland are admirable; and for a general and late crop, the lemon, red apple, old apple, and improved lumper—which is very prolific—are among the best varieties. There may be many others more deserving. The number from which good selections may be made in all localities is countless. One thing should be noticed here, viz., that though certain kinds may succeed in some soils and climates, they may prove unsuited to other soils and temperatures.

A notion of the variations in the productiveness of different sorts will be gained by a glance at the list* of 90 early and 40 late varieties of potatoes, respecting which, Mr. Howden, of East Lothian, has made careful experiments. Of the early sorts, yielding from 77 to 498 bushels per acre (Scotch, we suppose), the red nosed kidney was the least, and a white seedling the most prolific. Of the late varieties, the produce ranged from one which produced but 146 bushels per acre to Sanderson's Dunbar, which yielded 398 bushels "of healthy white, round, mealy tubers, of a very fine flavour." This amount of produce, however, was exceeded by the lumper, which "yielded 421 bushels of waxy tubers of a bad flavour."

The quantity and the quality of potatoes, even in soils of the same constitution, vary so much that

* Published in the 11th vol. of the Highland Society's Transactions.

no grower of a kind which may flourish in one part of the kingdom, can be sure of their succeeding elsewhere until the trial has been made. "It is proved," says Mr. Towers, "that potatoes which are excellent in west Wiltshire, as, for example, the varieties there termed the early purple eyed and the Prince's beauty, have deteriorated in Berkshire, treat them how you may. Lancashire is famed for its varieties which boil to a meal that crumbles under the fork, and is nearly as white as flour; but the varieties change in the midland and southern counties."

A good loamy soil is the best for the potato, but it will grow well in any dry soil, and is therefore admirably suited to general culture. It succeeds perfectly on reclaimed peat; and as both lime and potass are among the most appropriate elements of its food, well drained, shallow peat, resting on shallow gravel or other calcareous earth, in situations not too elevated, is easily rendered capable of producing large crops of this root, because by paring and burning the surface, ashes containing potass may be obtained in abundance; and the calcareous earth can be raised with little trouble from the undersoil to the upper, and blended with it.

Very sandy soils may yield early and good crops in wet, and fail from their too great porousness in dry seasons, and in clay soils the contrary is apt to be the result. Soils of medium quality are to be preferred, therefore, for potato culture. As lime is always an ingredient in loams, these are the best soils. The natural wants of a soil, however, can be, in great measure, supplied by the application of proper manures; and the cottager's dung and ash pit contain most or all of the nourishing substances required by the potato: the only danger is that he may not have enough of it.

The ground intended for the main crop of potatoes should be well and very deeply dug or ploughed before or during the winter. From the middle of March to the middle of April, after a second digging

or ploughing, drills should be opened at the distances of from 30 to 48 inches, (according to the quality of the soil and the nature and habits of the sort of potato to be planted), into which the manure is to be evenly distributed; the sets, either whole or cut, (in the latter case they should have been prepared a week at least), are to be laid on the manure, from about 8 to 13 inches apart, and covered, by shovel or plough, with the earth obtained by splitting each of the ridges that had been thrown up from the hollows, so that the top of the new drill shall be exactly above the hollow of the old one. By laying the dung over the sets they cannot be put out of their places by the feet of men or horses, as may be the case when the sets are placed over the dung; yet as some experiments have tended to prove that a greater produce is obtainable by placing the sets above the dung, it may be advisable to follow this practice, more especially in old clay land. When the sets are thus covered up, the raised drills should be beaten flat, or rolled, to close the mould completely over the sets and manure, and prepare a level surface for the rising stems. The English cottagers in general are too much disposed to crowd the plants, by which error they have weak stems and a deficiency of foliage, on the extent and vigour of which depends (if the stems be stout enough to support it) the amount of tubers.

In very thin soils a greater degree of breadth is necessary between the rows of potatoes than in deep ones, in order to obtain earth enough from the central parts of the bare intervals to protect and nourish the plants in the drills, without which their foliage would be feeble.

When the stems and leaves appear, it is useful to throw a little mould over them as a protection from frost, and also to suit the peculiar habits of the potato which thrive in a remarkable manner after such treatment. Even though light mould may crumble into the crown leaves, it will not prevent the plant from quickly forcing its way upwards, as if refreshed

by the apparent struggle. If a plough be introduced between the rows for earthing the stems two or three times, or the hoe be employed instead, care should be taken that neither implement be applied so closely to the roots as to disturb their fibres, which will not bear this treatment. This peculiarity in the potato is another reason why there should be a good deal of room between the rows to admit of the use of earthing implements without occasioning injury to the plants. For moulding potatoes perfectly, an Irish shovel of *narrow* breadth, and with a long handle, is a very convenient implement: the workman pushing the shovel forwards, raises the earth from the intervals, previously dug, and throws it to the right and left, neatly and carefully against the stems of the plants; and this he does generally three times in the course of the season, or as long as he can move between the high and luxuriant plants, and obtain mould for them without depriving any interlacing fibres of their protection and food.

Potatoes should not be stored until they are perfectly ripe, that is, till the stalks are fully withered. A fork with three or four prongs, flattened towards the points, and pretty close to each other, is most convenient for getting out the potatoes without cutting or bruising them.

Potatoes whether stored in a house or in heaps on the field, should not be put together in great quantities. If laid up in a cool store room, they should be spread as thinly as possible, and covered slightly with dry straw to exclude light, if there be a window. On this and other modes of storing we shall give the substance of Mr. Carmichael's prize essay respecting the potato murrain.

In an outhouse when the light cannot be excluded, a temporary screen of matting or canvass might be so placed as to shut out the light from the tubers. The buds should be pricked off before they rise above the surface of the potato, with a finger or blunt wooden skewer. Potatoes should be turned, without bruising

them. The soundest should be kept on the largest —and the red varieties, being the most compact, are usually the best keeping ones; but some of the white varieties have this property too. (We have seen prime *lumpers* in July when the red kinds were worthless).

When pitting (as it is erroneously termed, for there should be no *pits*) is resorted to in the field, Mr. C. recommends a good coating of dry straw next the potatoes, and over it a coat of earth six or eight inches thick, firmly laid on. In our own practice, we have rather disliked the use of straw, as apt to become mouldy and ferment, and have always found a coat of potato haulms, even withered, a very bad covering, from their tendency to heat and decompose. For a similar reason, if sods (turf) be laid next the potatoes, the grassy sides, in our judgment, should be turned outwards. If thatch can be afforded for the outside covering of the mounds, so much the better, in order to prevent rain and frost from penetrating through the coat of earth. In mild climates where severe frost does not occur, there is no better mode of preserving small patches of potatoes through the winter in the best state for eating, than to leave them in the garden where they have grown, if the soil be dry and absorbent, under a very thick carpet of dried sedge straw, rushes, or heath. Potatoes when taken up, after thus lying in moderately dry soil, and secured from frost, will be found more fresh and of better flavour than when kept in any other way.

THE CABBAGE.

THOUGH kale was known to our Anglo-Saxon forefathers, and probably introduced into Great Britain by the Romans, the firm-hearted sort of the *brassica* tribe, properly called cabbage, from a corruption of the latin word *caput*, which signifies head, was a rarity even until the reign of Henry VIII.

The varieties now cultivated in our fields and gardens are numerous, but for practical purposes in either department three or four sorts are sufficient.

For the field—the drumhead and large Strasburg, and borecole, afford ample supplies; for the garden—the Fulham, nonpareil, (these are closely allied, and nearly identical) Penton, and large green Savoy, with a few of the red Dutch, for pickling, are the best for the successive seasons.

First, with respect to field cabbages:—There are sorts—for example, the cow cabbage (or Cesarian kale, or cole, with other aliases), of which the most marvellous reports have been made. "Sixty plants of it are said to afford sufficient provender for one cow for a year; and as the side shoots only are to be used, it lasts four years without fresh planting. A square of 60 feet will contain 256 plants, four feet apart, more than four cows require for a year's provender, without the aid of other food." Next to this comes the Jersey kale: "It is much cultivated in Jersey, and attains the height of from 4 to 12 feet. The little farmers feed their cows with the leaves, plucking them from the stem as they grow, and leaving a bunch or head at the top. The stems are very

strong, and used for roofing small outbuildings; and after this purpose is answered, and they are become dry, they are sold for fuel. When the gathering of the leaves is finished at the end of the year, the terminating head is boiled and said to be particularly sweet." We have frequently seen this sort of kale in Jersey and Normandy, where the peasantry and others cultivate it in nooks of gardens and orchards for soup making: it ordinarily grows, in good soil, to the height of seven or eight feet. As to its utility "for roofing small outbuildings," by which pigsties probably are meant, we cannot assert anything of our own knowledge. But as a hungry hog might be tempted to devour its cabbage rafter, and thus bring down a house about its ears, we may at least doubt the economy of substituting such an edible material for the timber of the forest.

The common sorts of cabbage are biennial. The last named remarkable varieties are longer lived, and capable, it is said, of being propagated by slips. Yet as such deeply rooting and abiding plants must greatly exhaust the soil, the prudent farmer who understands the principles of vegetation, and knows the importance of having frequent and varied successions of crops, will prefer a triennial course of turnips, barley, and red clover, which tend to keep his land in good tilth and fertility, to the culture of a forest of gigantic cabbages, requiring three years for their completion of tenure, and which, with due allowance for exaggerated estimates of produce, would be much inferior in amount of weight and aliment to the aggregate of the other three crops. The superior worth of turnips generally to cabbages has caused the retirement of the latter from the contest in the field; yet, wherever a soil is unfavourable, to the Swedish turnip more particularly, and yet capable of yielding a crop of drumheads, these may be substituted with decidedly good effects for those; and in what soil will the cabbage, if well manured and well treated as to the tilth of the land, refuse to grow? Even cold, tenacious

clay, whether deep or shallow, in which turnips would become deformed and stunted, will yield cabbages, if the spade do its duty; and from 10 to 40 tons of cabbages per acre may be easily produced, according to the quality of the soil and its treatment. The enormous weight of 56 lbs. has been attained by some single heads of Strasburg cabbage, grown on a reclaimed bog, and from 20 lbs. to 25 lbs. of the same sort is no very uncommon average weight on friable and well manured land, if the plants be set at suitable distances. As cabbages come into use for cattle and store pigs after artificial grasses have been consumed, and before turnips or cattle beet should be drawn, they are calculated to afford, in judicious proportion, a valuable supply of food.

Cabbage seeds should be sown in seedling beds: those of drumhead, Strasburg, &c., in August, for planting out in spring; and the garden kinds in April, July, and August. The beds should be well manured, and after the plants are strong enough to bear removal, they should be pricked out four inches apart, into properly prepared plots, by which the number and vigour of their roots will be greatly increased, and their stems strengthened, instead of being *drawn* in the weakly manner observable in crowded plants that are left to struggle for elbow-room in their birth-place.

The soil designed for the plants finally, (and the transplanting of headed field sorts should be performed in April), should be dug or ploughed to the utmost depth, until it is perfectly loosened, and if the manure had not been previously incorporated with the soil, drills should be formed, 3, 4, or 6 feet apart (according to the probable extension of the plants) and filled with well rotted dung; the plants should then be laid down at their proper distances (say 4 feet for drumheads or Strasburgs), and firmly fixed in their places in the drill after the soil has been shifted over the dung, into the drills from which it had been displaced; each plant should be then held upright

with one hand while the earth is pressed firmly with the other, round the stem even to the collar, and so carefully that no part of the plant shall be covered with mould. If by pulling one of its leaves a plant should be easily raised, that plant has been imperfectly set.

When cabbage plants are put down with a dibber, care should be taken not to double up any part of the root (which is sometimes stupidly done with a very long stemmed plant) nor to leave the plant until the dibber has been so firmly pressed against the point of the root when put down (and this requires but little sleight of hand) that the plant shall have a fixed hold. In dry weather, the steeping of the roots in puddle before the plants are put down, is a good precaution against drought in the atmosphere, and the practice of trimming off leaves—unless those have been injured—is reprehensible, as the rooting of the plants requires the agency of the leaves. Trimming off healthy fibres from the roots previously to planting is another silly practice with persons, who—like mere practical field or garden workmen—are generally quite ignorant of the laws of vegetation. The root fibres are the mothers of the plants, by which they imbibe food; their number and growth, therefore, should be encouraged. For this reason, the deep and frequent digging of the intervals of ground between the rows of plants is necessary. The earthing of the stems tends to make them throw out additional fibres, which increases the fixity and the means of nutriment to the plants, and produces a series of water furrows, which in ill-drained land is so important.

The culture of cabbages in the garden does not differ in any material respects from that which we have particularised.

But it is to be remarked, that while the object in the field, generally, is to raise the largest weight for a particular season of substantial cabbages, without regard to the delicacy of their flavour, the intention of the gardener is to grow cabbages of the most palat-

able sorts during the entire year. For this reason, there should be, besides the three principal sowings enumerated above, successive sowings at those periods, so that if weather permits, the planting of some sorts of cabbage may take place during ten months of the year, November and December being the excepted ones.

The nonpareil comes in so early and heads so well throughout a great part of the year, that it cannot be too highly prized. We cut some heads of it in February last, and if the frost had not then affected the remaining plants, our supply of tender and delicately-flavoured cabbage would have been considerable. The plants had been put out late in October. If planted in February, in open weather, it stands the spring frosts as well, or better than other kinds; the early York rank next to this sort.

Cottagers and others who have no winter supply of borecole, or German greens, &c., should be made aware of the fact, that any of the headed kinds—the flat Dutch, for example—may be kept throughout the winter, if suspended in a sound state from the rafters of a dry room, put upright in sand, or stored in heaps with straw around them, like turnips or cattle beet. The Germans put the head, sliced, into a cask between thick layers of salt six inches thick, with a little pepper, one layer upon another, until the cask is filled. Then the whole mass is pressed heavily with a weight on a round board. The cabbage sinks from fermentation, and according as it falls, fresh cabbage and salt are added. After a certain time the liquid is poured off, and a fresh solution of salt is poured on, and repeated until the juice becomes quite sweet and clear. Covered with a cloth, and still pressed with the weight, the cabbage, under the name of *sour kraut*, remains ready for use at any time, and being freed from the pickle by being washed with pure water, it is a favourite German luxury when stewed with bacon.

THE CARROT.

THE approved varieties of the carrot, whether of field or garden culture, are not so numerous as to occasion to the cultivator any perplexity in the choice of them. The orange or light reddish vermillion sort is one of the best for field cultivation, and the early horn, or Dutch, (which is of a deep red colour and of short dimensions), for an early crop, and the late horn for a late one, are to be recommended for the garden.

The carrot requires a warm, light sandy loam; and whether the long or short-rooted sorts be preferable, must in general be decided by the depth of soil.

In the sandy soils of Belgium, a white sort of carrot which when trimmed averages a pound and a half in weight, comes regularly into the rotations;* and besides causing a great saving in the quantity of oats given to horses, enables the farmer to dispense with hay altogether. The condition of a Belgian horse, fed with from 20 lbs. to 25 lbs. a day of carrots, with straw or chaff, is good, and milch cows also thrive admirably on this diet.

In our own rich sandy loams, and thoroughly reclaimed peat soils of moderate elevation, carrots ought to be more cultivated than they are. In many districts, perfectly suited from soil and facilities of manuring, to the growth of this nutritious and palatable vegetable, it is entirely unknown as a field

* Besides being often sown as a secondary crop with spring corn, to produce fodder in autumn.

crop. This arises, like the modes of ploughing (as regards the strength of team) from a blind conformity to some provincial system, established without regard to exceptional cases, which everywhere occur, or due consideration of the peculiarities of soil.

The ground for either field or garden carrots should be turned and loosened deeply in the autumn or early winter; if trenched, the surface mould should be laid at the bottom, and manure may be then intermingled with the remaining portions of soil. If the manure be not perfectly blended with the mould before the time of sowing, the crop will be more or less deficient: and the deformity of forking, a sure evidence of unhealthful vegetation, generally affects carrots when their seed has been sown on ground freshly manured with undecomposed and fermenting litter; though, as Belgian practice proves, perfectly decomposed manure may be applied (on very loose soils at least) within a short time of the season of sowing. Mr. Burrows, who has long been one of the best authorities for the culture of field carrots, prescribes sixteen cart loads (drawn by three horses) of the short manure which the cottager's dung-heap supplies, to the acre.

After the first very *deep* autumnal working, the soil may lie until February or March, when it should be dug or ploughed 14 inches deep; the manure should then be put out and dug or ploughed thoroughly into the soil, after which it should lie undisturbed until about the middle of April. Mr. Burrows gives the following necessary directions as to the economy of the seed sowing: "Having weighed the quantity of seed to be sown, and collected sand or fine mould in the proportion of about two bushels to an acre, I mix the seed with the sand or mould, eight or ten pounds to every two bushels, and this is done about a fortnight or three weeks before the time I intended sowing, taking care to have the heaps turned over every day, sprinkling the outside of them with water each time of turning over." Thus the seeds

may be brought into a condition to vegetate rapidly when sown, and outgrow the quickly germinating weeds of the soil.

The same experienced cultivator has hoed the young crop, whether sown in drills or broadcast, about six weeks after the time of sowing, in order to cut up the weeds, with hoes 4 inches long and 2½ inches wide; a second hoeing (with hoes 6 inches long and breadth as before), was given when the plants were set, and finally they were hoed to from 9 to 12 inches, according to the probable size of the standing plants at maturity.

The tops of the carrots, when they begin naturally to fade in autumn, should be mown as fodder for cows; and the crop should either be *forked* out of the ground at the approach of frost, and packed (when cleared of the superfluous portions) in sand or ashes, or covered lightly with straw, or where hard frosts do not prevail, left in the ground, but covered over with a heavy layer of sedge or some litter to protect them from any frosts that may occur.

Experience proves to us that esculent roots, such as the carrot, parsnip, and potato, which remain in the earth during winter, surviving the seasons of frost, are, when dug up in spring, more juicy, tender, and fresh, than those which have been removed from their parent bed to a store room or a pit where they are covered, heads and tails. A moderate defence of heath, ferns, sedge, or any other inexpensive litter would, in frequent instances, be the best preservative for the valuable vegetables to which we have just referred, during the winter months. It is, however, desirable to have some supply of them out of the ground for use at times when it may be injudicious or inconvenient to remove their covering and disinter them.

When vegetation is about to commence in spring, such roots as remain in the ground should of course be taken up; the crowns of carrots should be cut completely off and given to cattle; the remainder

will keep for horses until summer. If the carrots had been stored in the usual way, the heap should be examined in March, and the soundest ones selected for late use, and cut clear off from their crowns. A fortnight previously, some of the most vigorous and best roots should be planted out (two feet apart) for seed-bearing in the following autumn. Every farmer or gardener should make a point of raising seed for his purposes, else he can rarely be certain of having a genuine sort.

From 20 to 30 tons per acre is the usual produce of field carrots; but though a much greater weight of turnips may be expected with similar good management, and on a very favourable carrot soil, the superior alimentativeness of the former, and of flavour, render it a more valuable crop when it succeeds. Like the turnip, the carrot in its early stage of growth frequently suffers from insects, which a sprinkling of soot would probably destroy. By sowing the seed thick, an allowance is made for the ravages of these destroying grubs, and late sowing is considered a preventive against their attacks, by allowing them time to attain their fly state before the seed comes up.

The culture of the carrot in a garden differs in no essential particulars from that of the field. The seed, however, should be sown in the former case in successions, beginning with January and February, (with protection) for the early sorts, sowing in March and April for the main crops, and in May, June, and July for the late ones. A sowing may take place in August (with protection during winter) for an early supply in the following spring), in sandy soil, and sheltered situations. Though the hardier parsnip can fight its way through a comparatively strong and cold soil, the carrot is unequal to such a contest. It is, therefore, useless to force its culture in any ungenial soil, as it is injudicious and thriftless not to cultivate it in any soil and situation which may be remarkably favourable to it.

THE PARSNIP.

THE preparation of the soil for parsnips is precisely such as has been stated necessary for carrots; a considerable depth of soil must be obtained for the successful growth of either of these vegetables. But the parsnip, though it will thrive best (what vegetable will not?) on a rich sandy loam, is raised without difficulty on inferior soils, provided they are loose in their texture, and have a clay undersoil; for though naturally poor, they may be sufficiently enriched by manure, and though shallow, they may be made deep enough, by forming the surface into narrow ridges. Coarse gravelly and ill-drained clay, and all very shallow soils with a hard peat bottom, are quite unsuitable to the culture of the parsnip. Colonel Le Couteur, the most distinguished cultivator of the soil in Jersey, has stated that in an island (which has not the advantage of the calcareous soils that are frequent in many districts of the British islands) the parsnip thrives in any deep land, whether stiff or light,—on clay or on a gravelly bottom,—on almost pure sand, if mixed with a light coating of earth, and that even on poor black heath soil, not more than 7 or 8 inches deep, a good crop may be raised with heavy manuring; but in the latter case, though it forms a large shoulder, the root forks away when it comes near the hard undersoil.

The kinds cultivated are so few that we have no trouble as to selection. The common and the long Jersey are sufficient for any purposes; the former is more generally sown in the garden, the latter in the

field, but this deserves to have exclusive possession of both, where the soil is deep enough naturally or can be made so artificially for growing a plant which may be expected to attain, even under ordinary circumstances, and in a climate inferior in warm moisture to that of Jersey, at least two feet in length of root, of which the upper part will be from 2½ to 3 inches or more in diameter. To insure good seed with certainty by any cultivator, roots (from the preceding year of course), should be planted in February, and the crowns should be covered with earth, in some open situation for seeding. This is desirable, because parsnip seed cannot be depended upon after the first year, and seedsmen may make mistakes sometimes as to the age of seeds, or possibly mix the old and young seed together by some inadvertence. For a bed under garden culture) 20 feet long and 5 feet wide, half an ounce of seed will be sufficient, on the supposition that the plants are to be thinned out 8 inches every way. In field culture, where the plants are to stand at 12 inches in the row, and in drills 16 inches apart, 1 lb. of seed is the proportion for a rood of land. According to Col. Le Couteur's practice, the seed should be moistened with wet sand or earth, and stirred in dry weather, as a fit preparation of it for sowing it, when the first moist weather or a shower disposes the soil to receive it genially; thus earlier maturity of the plants will be secured. He adds this caution that "in all cases seeds that have been moistened should be sown on moist ground, for if small moistened seeds especially, be sown on a very dry soil, under a hot sun, the chances are that they will be dried up and destroyed." The quick evaporation of the moisture causes this effect.

The season for sowing the seed in gardens is from the end of February to the middle of April, and in the field, from the middle to the end of March.

Very large parsnips may be raised by the following simple process: take a round stick pointed at one end, about 3 inches in diameter at top, and say 4 feet [redacted]; thrust it to the depth of 2½ or 3 feet into loose

earth; after drawing out the stick fill the hole with rich compost; sow a grain or two of seed in it, and the parsnip will grow, the upper part of which will be as exactly the size and form of the hole as if it had been moulded there, and grow in a very tapering shape to the utmost depth of the opening. We have grown parsnips in this manner, and with great success. Parsnips should be weeded and thinned like carrots; their leaves, also, are equally or more beneficial in autumn for cattle.

The weight of produce may be estimated at about 10 tons to the acre; but in Jersey, the quantity has been nearly 30 tons in cases of competition for prizes.

Forking out such deep-rooting plants, is so tedious an operation on a large scale of culture, that in Jersey a plough is often used instead of a prong. The coulter is taken out and a blunt share is retained, "the pressure" says Col. Le Couteur, "of the plough and earth forces the plants out of the ground, and though a small portion of the long tapering root is sometimes broken off, yet the time saved by thus raising them, and afterwards throwing them out of the loosened soil, as is done with potatoes, is an enormous saving of time over the ancient practice of forking out each parsnip separately from the solid ground."

The parsnip is highly nutritious, a mess of boiled parsnips and potatos with butter or milk is a favourite dish with many labourers; and it deserves a much more extended culture in Ireland as an ally of the potato than it meets with there. With the poor the chief objection is the difficulty of providing sufficiency of manure for it. It certainly will not succeed without it, nor with the merely superficial tillage of the soil. As a preparation for wheat, it is an admirable crop, for it necessitates a deep digging of the soil and perfect freedom from weeds, if it be heated from first to last as it requires to be. For cattle, pigs, and poultry, the parsnip is excellent food; they eat it with avidity, and fatten speedily upon it. Parsnip wine is a well-known luxury, and made with little expense or trouble.

THE TURNIP.

THE turnip which human industry has rendered so especially valuable for fattening cattle and sheep, and through their means fertilizing the soil for the production of grain crops, was originally little different from the wild mustard plant. Norfolk claims the honour of having first adopted the field culture of turnips, and Northumberland, and some southern counties of Scotland not only promptly followed the lead in this instance, but improved upon the practice. "Before the introduction of this root, it was impossible to cultivate light soils successfully, or to devise suitable rotations for cropping them with advantage. It was likewise a difficult task to support live stock through the winter and spring months; and as for feeding and preparing cattle and sheep for market during these inclement seasons, the practice was hardly thought of, and still more rarely attempted. The benefits derived from turnip husbandry are, therefore, of great magnitude. Light soils are now cultivated with profit and facility, and abundance of food is provided for man and beast."

The best soil for turnips is a deep sandy loam; but light, sandy, and even strong clayey soils, if well-managed, yield good crops of turnips. On undrained and insufficiently worked clay land the turnip, indeed, often fails; the roots meeting a hard, cold, or wet bed of earth, become deformed and diseased, and a very poor crop is the result. But the farmer is to blame who does not first drain and then effectually pulverize the soil before he sows his seed.

For very light and sandy soils and in cases of limited manures, the varieties most suitable are the globe sorts, whether the red or green Norfolk, or the Prussian white; they derive much of their nourishment from the atmosphere, and yield, under the disadvantages just stated, a greater weight of produce than the Swedish or any other of the tankard-shaped turnips; but they (the white especially) are watery and innutritious, and as mere bulk is of little importance comparatively with solid nutritive matter, the globe sorts are objectionable wherever the soil is fully capable of producing the more substantial Swedes, unless it be for use in the first part of the feeding season and to make way for an early corn crop. The Swedish turnip, the *ruta baga*, as it is botanically named, is pre-eminently good, having not only great solidity and very nutritive qualities, but also possessing the powers of resisting frost and of keeping to a late period of the spring. The yellow Aberdeen is also an excellent sort (a very mild and agreeably flavoured table variety also) for use between the seasons for consuming the globe sort and the Swedish. The small round white variety, known by the names of 'the stone' and the 'six weeks', sown on stubble fallows in August, is equally good for the kitchen and for sheep-feeding.

Though even very old turnip seed will grow, if it has been well preserved, it is considered prudent to use fresh seed in preference where the turnip crop is liable to the attacks of the fly, which so frequently destroys it, because new seed will grow more rapidly and vigourously than the old, and therefore have a chance of escaping from the fangs of its enemy. On the other hand, new seed may happen to come into leaf at the critical period of a drought or a blight, when the fly will attack it, which plants from old seed, being less advanced, might escape at that critical moment. For this reason, some persons sow old and new seed together. Those who wish for the undegenerated seed of turnips should either procure it from the best

sources or save their own seed from healthy plants. The degenerated Swedish turnip may be known by the bright yellow hue of its leaves. A brownish yellow indicates the true sort, and it is recommended by the Norfolk growers to take seed only from turnips that have been transplanted.

Half a pint of seed would be sufficient for an acre, if economically sown in drills; but it is better to be liberal, since the seed is so inexpensive, to provide against the ravages of insects, on which account 2 lbs. of seed at least is usually sown to the acre.

Broadcast sowing, though common in many parts of England, is not to be recommended in preference to drilling, except, of course, in the instance of stubble or brush turnip seed, sown on stubbled land well-prepared for sowing; the subsequent operations of hoeing are more regularly executed in drill culture, and if the manure be concentrated in the drills, the seeds are pushed forward by it more rapidly and vigorously than where they have no certainty of coming into immediate contact with manure diffused thinly through the soil.

The seasons for sowing field turnips are, in the north of England, from the middle of May to the end of June. In the southern counties, the sowing is sometimes continued a little later, but it rarely commences before the middle of June. Where the vegetation is too much advanced, the root does not bulb properly, and also if too early matured, the object of providing winter and spring food, as regards the Swede especially, for sheep and cattle is not realised. The cool and temperate climate of Ireland is admirably suited to turnip culture; there is no doubt that a much greater weight of turnips on any given space can be raised there than in the southern counties of England. Swedes of 12 lbs. each are not uncommon in Ireland, raised by some of the yet few (comparatively with the British) cultivators who devote some portion of their land to the growth of them; whereas, nothing like this produce is attainable in the more

dry and warm climates of the midland and southern English counties; in the north of France, nothing approaching to such weight could be raised in average seasons; in the south, turnips are mere abortions. In Germany, Von Thaer could never raise one with all his care above 14 lbs., and has recorded that half a pound is the ordinary weight of field produce. A hot and rapid climate is quite unsuited to this important root. Yet so much do our own soils, climate, and modes of cultivating the turnip differ, that the produce may be said to vary from 10 to 30 tons per acre. If every square of 24 inches yielded a root 2 lbs. in weight, the produce would be at the rate of 23 tons per acre. This is a moderate calculation, yet the farmer very seldom has so much produce.

For *domestic* use, the early Aberdeen is the most hardy and suitable turnip for late winter and spring use, and for all purposes it ranks next to the Swede in value; the early green, and for kitchen use generally, the small round green, the Prussian white, and the stone or six weeks', sown in August, are to be recommended.

THE BEAN.

This vegetable, which is of the leguminous tribe and a native of the east, has been known in this country from a very early period, but its frequent field culture —especially in drills—is of modern date. There are but few *real* varieties of it for either field or garden; for the field, by which we mean for the feeding of horses and swine, the Heligoland and tick beans, and a winter sort introduced into Lincolnshire first from France, are the kinds in common use. For the garden, the mazagan, the early, the large long pods, and the Windsor, with its sub-varieties, are enough for all

seasons and soils. The bean is a very hardy plant, and being highly nutritive for man and beast, is well-deserving of regular culture, more especially by the working classes of men, when they can afford the luxury of bacon with them.

The soil best suited to beans is a strong loam, but very clayey soils are also congenial to their nature and habits, as they are able to force their stems and roots through an extremely adhesive body of earth. What are termed turnip soils are quite unsuited to them. They may be sown in autumn or spring. In the former case, the winter variety above referred to is the sort exclusively sown, as it stands a severity of frost without suffering injury. If, therefore, leisure permits the farmer to prepare his land in October, and the season be favourable for the purpose, there is no well-founded objection to his sowing them. The weight and quality of the crop will probably be equal in both cases, but the autumn-sown crop will ripen a fortnight earlier than the other, which may be important, by enabling the cultivator to prepare the land for wheat or any other succession sooner than he could in the other case. Field beans either follow wheat, for which the land had been previously manured, or with manure, precede it. Being thrice hand or horse hoed in the months of April, May, and June, the land after the bean crop is usually in a sufficiently clean condition for the corn crop. The common Scotch mode of cultivating beans in wide drills keeps the ground perhaps freer from weeds than the favourite English method of dibbling the seed in rows but 16 inches apart. The drills in the former practice are formed as for potatoes or Swedish turnips, at intervals of 26 inches; short well-rotted dung or compost is spread in the drills, and after the seed has been dropped on the manure by a drill barrow, or otherwise, it is covered up by splitting the ridgelets of mould between the drills. When the beans are appearing above ground, a harrow is drawn across the drills which levels the surface for the succeeding operations of

horse-hoeing and hand-hoeing, so that no weed is left between the plants; what the hoe may fail to do, the fingers of women or children accomplish. The only objection that we see to this mode is, that much more seed is sown than by the English one of dibbling, which is performed at less real cost, too, than that of the horse labour employed for the same purpose in Scotland. If the land under the dibbling system could be equally well cleared and loosened, this would be the better method. Plants may be huddled together in a drill as much as if they were sown broadcast, and when this is the case, besides the loss of seed, which in the present instance is costly, the stalks will not pod or fill at the lower parts.

Where partial failures of wheat plants occurred, the planting of mazagan beans has been tried with good effect, and the practice of scattering beans thinly through the cottager's drills of potatoes is an economy to be recommended.

To prevent the stalks from exhausting their vigour by growing too high, and thus carrying up the sap to lately-formed and green pods, while those below are ripe, it is prudent to pinch off the tops when they attain sufficient height. The haulms should be cut when ripe with a sickle, and after the sheaves into which they are bound have been thrashed, they make good fodder—if chopped, and boiled or steamed—for horses.

In the *garden*, mazagans are sometimes sown in October and the two following months for a very early crop, but the success of these sowings will be always uncertain. The early long pod, if sown in January, is more likely to reach maturity. Some of the varieties of the long pod will be pretty certain of escaping the dangers of winter if sown in February, except in the northern counties, and the Windsor and other sorts should be sown for certain produce, in March, April, and May.

THE PEA.

THIS plant has many admirable varieties, though a select few are sufficient for cultivation. The early Charlton, and the common white and Suffolk sub-varieties of it are, in many localities, sown with equal frequency in the field and the garden for table use; the low-growing sorts, which require no stakes, being of course those that are suited to the extensive culture in the field. But the grey kinds are the ordinary varieties for the farmer's purpose, whether he applies the produce to the fattening of his own swine or sells it for a similar purpose.

The pea requires a sandy loam or other warm calcareous soil, free from stagnant moisture, and also a climate usually dry in summer when the crop is ripe. The grey sorts are sown as early as possible in the year, to have the crop off the ground in time for one of turnips; and from February to April is the season for sowing the other sorts. To economize seed and admit of perfect hoeing, field peas should be sown in drills. The haulm is superior as fodder to that of beans, and therefore should not be used merely for litter.

In the *garden* the early Charlton may be sown in successions from the beginning of November to the end of February. The seed sown in this month has much more chance of outliving the winter than the earlier ones, under ordinary neglect of protection. The early frame is another of the most approved early varieties, and Knight's and the whole family of marrowfats—with Thurston's 'reliance' in particular

—should be successively sown from March to June, at intervals of three weeks in spring and a fortnight in summer. For very late crops, the seed should be that of early kinds, because these complete their growth in a shorter time than the late and slower-growing sorts.

In saving seed of peas or beans, it is not prudent to take the *gleanings* of the crop which cannot be the most vigorous, and are obviously the latest in growth. To procure an early or late sub-variety of any sort, the first and last ripened pods of that sort should be carefully selected and stored separately; by repeated sowings and the same management, the habit of earlier or later ripening will thus be imparted in course of time to the seed. In gathering young peas from the first crops, much waste is committed; pods but half filled are pulled from their stems, and the consequence is, that besides the loss occasioned by using the immature fruit, the succeeding pods from the same stalks will not acquire the plumpness which they would have attained if the former pods had been left a little longer on the stems. This may possibly be occasioned by the premature exhaustion of the plant through the loss of sap which it sustains in those parts where the yet unperfected pods are taken off. The sap is in full flow to the young pods, and bleeds forth on their removal—an exhausting process, which does not take place when the pods are so far ripened as to have ceased drawing nutriment from their succulent parent, which then directs its juices to the parts in need of them.

MANGOLD WÜRTZEL.

THE value of this truly excellent forage plant, is now pretty generally understood, and its culture as a store for winter use extensively adopted: to the cottager who is the fortunate holder of an allotment, and possesses a cow or a few pigs, it is one of the most profitable crops he can grow, yielding more bulk with real fattening qualities, than perhaps any other root we have. The beginning of May is perhaps the best time to sow it, for if sown earlier on light land, it is liable to "run" or grow to seed, instead of forming large roots: and on heavy soil it is generally impossible to get the seed in properly till dried by the sun of April. Whoever attempts to grow mangold würtzel in the most profitable manner, or so as to obtain the greatest weight per acre, must previously get the ground in throughly good order, and allow the plants plenty of room; it is an acknowledged fact that the majority of the crops of this root are spoiled for want of thinning. On good land, each plant will fully occupy a square yard, and when left closer than that, a decided loss upon the gross weight is incurred; there is plenty of proof that the roots may be grown to a much greater size than is usually done, near 3 cwt. having been reached on several occasions, and that it is entirely dependent on the space allowed. Mangold würtzel may also be grown as a green crop, to be eaten fresh in the autumn months, when in dry seasons grass is scanty, and is of much assistance, especially to dairymen. Employed in this way, it may be left much closer, say twenty inches between the rows, and a foot from plant to plant, the culture may be confined to one thinning

of the plants, and once ploughing or hoeing to destroy weeds: the return will be an immense mass of food, which, mixed with hay or some dry fodder, will be highly nutritious. In storing this root, make small ridges and cover with waste hay, or *bruised* straw, over which a thin coat of mould may be spread and beaten smooth, the latter is merely to keep the previous covering in its place. A much better, and in fact the only true way of successfully preserving these and all other roots, is to lay them up in small heaps in a store-house, and keep them perfectly dark and dry; removing them a few at a time as they are wanted.

THE ONION.

DISAPPOINTMENT being frequent in this crop, from the plants running up without forming bulbs, or becoming thick-necked, it may be well to inquire into the probable causes of such malformations, and if possible, be prepared with a remedy. The onion in its natural state is represented as destitute of the swollen or bulbous part for which it is cultivated, and closely resembling the leek in appearance; this assertion rests only on the fact of such a form being most common when the plants are neglected, for wild onions are not known. Coupling, however, the fact with the theoretical notion founded upon it, we may readily infer the inclination to degenerate, or go back to the straight leek-like form, so much dreaded by onion-growers: and as the same thing is constantly occurring with other highly-cultivated roots, it must be admitted, that a great probability exists of the quality of the seed being concerned. Those who desire to raise good seed of any kind, find it necessary to save from only the very best plants, a rule which holds with

equal force in all cases; but it may happen from circumstances which need not be explained, that large onions are not planted for seeding, smaller and inferior roots being substituted, the produce of which, to say the least, is likely to be thick-necked; here, then, we have a probable cause of the loss complained of. Another reason, about which not the slightest doubt exists, is to be found in the manner of hoeing the crops when thinning the plants or destroying weeds; if in the course of that operation the earth is drawn up the stems of those left to form the crop, a great portion will be found to fail. Sowing when the land is wet is another fruitful source of evil; the drills are then unevenly made, and when raked over, the irregularity is increased, part being filled with large clods, and the rest left without covering; the seed buried beneath the extra depth of soil, probably perishes, or that which may grow, having to ascend through so much earth, is blanched and weak, and quite unable to form bulbs.

The preventive measures are—first, grow your seed from the very best roots of the previous season's growth; second, sow it only when the ground is dry enough to bear raking with facility, and in very shallow drills; third, thin the plants with a knife instead of the hoe; a little practice will make it the handier tool, and the work is done more effectually, because it reaches to the bottom of the stems: those cut out with the hoe, it is well known, frequently spring up again, from the roots and base of the stem being left in the ground; this cannot happen when the knife is properly used. For cleaning the beds, trust chiefly to hand-weeding, loosening the soil afterwards with a knife. Fourthly, when the plants have grown to the thickness of a finger twist their necks, bending them all downwards; this checks the rising of the sap beyond the part which should become the future bulb. Where great quantities are grown, this operation is most readily performed by passing a pole over them with sufficient force to bend the stems close to the ground.

RHUBARB.

FOR upwards of two centuries this wholesome root has been known in England, and it is now among the most esteemed of our spring productions. It was originally brought from Asia, and in that quarter of the globe is abundant throughout the more temperate regions. In this country its culture costs but little trouble, as it is hardy enough to thrive in the most exposed situations; and the attention given to it for so long a period, has resulted in the production of several varieties, some more forward than others, so that a continuous supply may be obtained throughout the entire spring.

Rhubarb delights in deep, rich land, and that which is naturally moist, or of an alluvial character, will grow it the finest. Clay and gravelly soils are unsuited without much preparation: the first requires to be well drained, and the subsoil broken up in the trenching to facilitate the spread of the smaller roots, whilst the gravel should be rendered more holding and cool by the addition of loam and cow-dung, the latter being a most excellent manure upon all light lands, as it is less heating and lasts longer than any other.

The plants may be raised either from seed or by division of the old roots. If the first method be adopted, some care is necessary in the choice of seed. Let it be the produce of such kinds as come nearest the qualities desired in the future plantation; seedling plants vary a little, both from their parent and from one another. Still the greater part will be found to retain the principal characteristics of the kind from

which they sprang. Thus the earlier sorts will, in general, retain their precocity, or at least their seedlings will always be of quicker growth than those obtained from the late kinds, and so of all the other properties. In March, a bed of rich earth should be prepared by manuring and thorough trenching, on which the seed may be sown at once in drills, fifteen inches apart, and if the seed is quite new, it must be sprinkled thinly in the rows: to be afterwards thinned when the plants have grown two or three leaves, in proportion to the goodness of the ground and the character of the sort. The largest kinds on strong land should stand eighteen inches one from another through the first season, while for the smaller sorts one foot will be sufficient; they will require no further attention after this thinning, except to be kept clear of weeds until the autumn, when as soon as the leaves have died down, and while the weather is yet favourable, they should be transferred to the ground intended for their permanent growth. On the choice and preparation of this, much of the future success depends, it should be as nearly like that previously described as possible, and in a position sheltered from the sweeping winds of the north; a liberal coat of manure should be trenched in,—the ground being turned to a depth of eighteen inches, or two feet, and on this the plants are to be stationed about a yard apart. Their subsequent management will be confined to an annual digging, turning in each time a good coat of the strongest manure, and the constant removal of flowering heads, except when seed is required. In the first spring after planting, some few of the stems may be gathered, but it would be unwise to take more than a third, lest the plants suffer: in the following season, however, they will yield a full crop, and it should be borne in mind that the stems must never be cut from the plant, but pulled off by a smart jerk on one side. Such plantations continue in use from seven to ten years. If the plants are multiplied by separating the old stools, it should be done

in autumn, and the pieces are then to be planted or trenched in, as recommended for seedlings at the end of their first summer.

Rhubarb is very easily forced so as to be fit for use throughout the winter and early spring months: any place a few degrees above the freezing-point, where it may be supplied with moisture, will produce it, though of course its progress will be proportionate to the warmth supplied. Market-gardeners usually dig a trench about two feet deep, in the open ground, in the bottom of which the roots are placed; the top is covered with hurdles, and over them a thick coat of hot dung. This is by no means the best method, though an easy one, as a great part of the heat of the fermenting material is lost, while the drainage falling through upon the plants, is likely to impart an unpleasant flavour. Where only a moderate quantity is wanted, the best plan is to cover the roots with pots or boxes, and throw about a foot of fresh tree leaves, or half-spent dung round them. If three or four plants are thus treated at intervals of a week, a continued supply, sufficient for a moderate family, may be depended upon. In the absence of any better means, rhubarb may be forced by merely placing the roots in a closet or cellar, secure from frost, and with no other trouble than to surround them with earth, and give a moderate watering once a week, very palateable stems will be quickly produced; it grows equally well in the dark as in the light, though the produce has rather less flavour. Of the sorts commonly cultivated, the following six are among the most useful: the first three are early or quick growing kinds, the others are late, and usually produce much larger stems—Mitchell's Prince Albert, Myatt's Linnæus, Tobolsk, Old Scarlet, Myatt's Goliath, Large Red.

INDIAN CORN.

INDIAN corn, or maize, is a plant very little known in England, but it is extensively grown in America, Spain, Italy, Egypt, and many other countries.

About twenty years ago, Cobbett recommended its cultivation as an article of food far superior to the potato in nutritive quality, far exceeding, in produce, that of all other corn in quantity. Probably, however, he too highly estimated the benefits to be derived from it; for though in some fine warm seasons it may be successfully grown here, yet our fluctuating climate renders the crop exceedingly hazardous and uncertain. There are many varieties, some of which are more hardy than others, and may be grown in England.

The cultivation is easy. The corn should be planted in May; if put into the ground earlier, it is liable to be destroyed by frosts. Plant in rows two feet apart, and nine inches between each seed. If grown in the garden instead of the field, it will be advantageous to raise the plants first in a hot-bed, or in a warm border under a frame. This method is desirable, not only on account of forwarding the plants, but also because, when transplanted, the redundant growth is prevented, and the ear is more perfectly matured.

A new kind of maize, imported from Spain, has been grown in the neighbourhood of London, during the past year, with such success, that there is very little doubt but that in a few years this species of grain will be more valued, and largely cultivated by English farmers.

Indian corn is very nutritious; and while its cultivation is no longer to be regarded as impossible, all who wish to extend the range of their comforts, should give it a much higher place in domestic economy than they have hitherto been willing to do. In the south of Europe it is much used for making bread. In Italy, the flour made from it is called 'polenta,' and many very agreeable and economical dishes are composed of this flour. In the United States, a farinaceous food is prepared from the superior kinds for infants, which is said to keep them free from certain internal complaints to which young children are subject.

There is one kind which we have quite successfully cultivated in a garden;—it is that known in the United States by the name of 'sweet corn,' as it contains a greater portion of sugar. It is a very delicious table vegetable, and is used in an unripe state, as we use peas and beans. The method of cooking is by simply boiling the ears, which, when seasoned with pepper and salt, are taken in the hand, and the corns bitten off, somewhat similar to our manner of eating asparagus, which vegetable it rivals in flavour and delicacy.

Indian Corn Bread.—To a quart of sour milk or butter-milk put as much of the meal as will make it a thick batter; a little salt, and a teaspoonful of carbonate of soda dissolved in water, acts upon the acid of the butter-milk, and the effervescence causes the bread to be light: a spoonful of sugar is an improvement, and so also is a little butter or lard. This must be baked in well-greased tins, allowing the cakes to be about an inch thick: a quick oven is indispensable. They are best eaten hot, but are very good cold. Treacle is capital with them. When sour milk cannot be procured, new milk may be used, with a tablespoonful of vinegar; but the carbonate of soda must not be stirred in till just before putting in the oven.

Mush.—This is the same thing as Lancashire oatmeal porridge: it must be very well boiled. In sum-

fact may not attract all the attention it deserves. But our wheaten flour will not always be so cheap as it is now; and then it may be well for our readers to be aware of the facts we are about to state.

The grain of Indian corn contains an acid moisture which, on coming into contact with the air, unites with the oxygen of the atmosphere, and is changed into a substance which has a very bad taste. If the grains could be brought over the ocean, every one whole and entire, the flour from them might be quite good when fresh from the grinding; but, even then, only for a very short time. There will always, however, be some broken grains, and they will spoil the rest. The only way is to get rid of the moisture before the article is shipped in America; and this is now done, quite perfectly, by the patent process of Mr. Stafford, at New York. The meal is passed over warm cylinders, so as to evaporate every particle of moisture, without having any effect on the other qualities of the flour. The flour comes away almost as indestructible as sand, and as sweet and as nourishing as flour can be. Some of it has been carried round the world, and brought back as good as ever. Some has been laid up in a garret for two years, and then brought down as good as ever. Now, that such an article of food as this is to be had in London for 1d. is a fact, which it is as well for everybody to know. When we think of the thousands of hungering peasants in Ireland, and of the thousands of gaunt Highlanders now (as in the Island of Skye at this moment) going down to death from sheer starvation, and then of the thousands of miles over which the maize is waving in the western valleys of America, we feel as if we cannot be too earnest in calling attention to the working of Mr. Stafford's patent.

We have lying before us at this moment, copies of letters from Windsor Castle, from Dublin Castle, from Downing Street, and from other great houses, conveying the opinions of the Queen and Prince Albert, the Lord Lieutenant of Ireland, the Lord

Chancellor, Lord John Russell, and others, that the bread made from flour thus prepared is most excellent. The article is getting into use largely in London. Specimens of it may be seen in the Great Exhibition, in the American and refreshment departments. Those who wish to make trial of it in the form of bread can have it of Mr. James Turner, 67, Bishopsgate Street Within, London. If, for economy, a family, or a set of neighbours, wish to buy a barrel at once, they had better apply to the American agent, Mr. Stansbury, 5, St. Matthew's Place, Hackney Road, London. Either of these gentlemen will furnish printed recipes for various puddings, cakes, and kinds of bread for which this flour is most appropriate.

THE VEGETABLE MARROW.

A FEW years ago, this useful vegetable was very little known, and was considered so great a luxury, as to be only seen on the tables of the rich. It has now become more common, and from its merits may prove a very serviceable as well as agreeable substitute for the potato, while its amazing prolificness renders its cultivation a matter of economy for every one who has a garden.

The vegetable marrow is exceedingly nutritive and wholesome, either in a ripe or unripe state, and it has been proved to be quite free from that property of injuring delicate stomachs, which many green vegetables are said to have.

There are several varieties, varying in size, shape, and colour. The striped and speckled, dark green kind appears to be the most productive, but is not so pleasant in flavour as the light green variety, which assumes a

pale straw-colour when ripe. The seeds or plants of any sort may be procured at a nursery-man's, and should be sown or planted as early as possible in June, as they will then bear to be in the open ground. The richer the soil, the more rapid and luxuriant will be the growth. As they come up, and while young, the plants must be well watered, and shaded from the burning sun, until they have acquired strength. They may be grown in odd corners, not suitable for other things, upon dung-heaps, or trained along palings or walls, or over arbours, or the walls and roofs of cottages, in any way that taste or convenience may suggest. Nothing can form a more beautiful ornament to a garden than the vegetable marrow, trained either on a trellis or on poles; the magnificent golden blossoms interspersed among the dark green, vine-like leaves afford a specimen of oriental vegetation in all its luxuriance and beauty.

If in beds, the plants should be placed in rows eight or nine feet apart, and about three feet between each plant in the row. The general culture resembles that of the cucumber, and usually, if raised earlier than June, they require the protection of hand-glasses during the cold nights. The leading shoots, when about three feet long, should be stopped, by pinching off the head, that lateral, fruit-bearing branches may be produced. These must be pegged to the ground by bent twigs, as they advance in growth, so that the ground may be equally covered, and the fruit not prevented from ripening by the crowding of the branches together. The earliest fruit should be taken off, otherwise the plant will not grow strong and productive. When the soil is rich, more than one hundred of the fruit may be cut from each plant, varying from one to two or three pounds in weight, besides leaving several to ripen.

When eaten green, they should be boiled whole in plenty of water with a little salt; they must boil according to their size from twenty minutes to an hour or more, until they are quite soft. Many persons

have a prejudice against marrows from having tasted them half-cooked, in which state they certainly are not agreeable. When well done, take them up carefully, cut them open, and drain the water from them. Eaten with gravy from meat, or served up on toast with melted butter, or even with pepper, salt, and a little plain butter, they are, in our estimation, a delicacy not excelled by sea-kale or asparagus. The Italian method of cooking them is first to boil, then to cut in halves, and roast in a Dutch-oven before the fire, sprinkling with pepper, salt, and butter, and a little grated Parmesan cheese.

When ripe they are also excellent as a table vegetable, if cooked in a proper manner. The following is a good method:—Cut the marrows into suitable-sized pieces, take out the seeds and spongy parts, boil in a good quantity of water, until soft enough to be mashed: when taken up, scrape of the yellow outside skin, mash with butter, salt, and pepper, as you do potatoes, and you will have a treat.

There is another purpose equally, if not more valuable, for which vegetable marrows may be used; that is, as food for pigs. The crop is so abundant and so rapidly produced, occupying the ground but a short time, that it may be justly considered one of the most profitable species of food for swine feeding. The fruit may be given to pigs either green or ripe, but in either case should be boiled. Indeed almost all food for pigs is more fattening, and consequently more profitable, if boiled first. It will be an advantage, perhaps, to mix the boiled marrows with the grain food for fattening hogs.

A writer in that able publication, the *Gardener's Chronicle*, thus speaks respecting this useful and delicious vegetable:—'I have been trying various experiments this autumn with ripe vegetable marrows, and I find they contain a rich sugary and farinaceous matter. To my taste, they are fine; and by those gentlemen to whom I have sent them, they were very much approved of when cooked in the following man-

ner:—Cut the marrows into manageable lengths, take out the pith and seeds, boil them in plenty of water and salt, and when well-boiled, scrape out all the marrow, and put it between two dishes and squeeze out all the water; then give it a little salt, pepper, butter, and milk, and mash it well; it is then fit for a queen, let alone a poor person.'

To Preserve Vegetable Marrows.—The following method, recommended by a country farmer, affords some valuable hints on this subject. Hitherto it has commonly been supposed that the marrow will keep only for a very limited period. Should these statements, however, be verified by more extended experience, we venture to predict that the marrow will become one of the best known and most valuable of English vegetables:—

'We have for several years been in the habit of keeping vegetable marrows for a considerable length of time, and succeeded in doing so in very different climates. It was not, however, until the season of 1847 that we discovered (through accidental delay in the consumption of our stock) that this valuable and elegant addition to the table might be preserved, in perfection, far into the spring of the year following its production; and that it would thus keep, merely by laying the fruit on shelves, or on a dry stone floor in a roomy dairy, of which the window was constantly open by day until the winter set in, though after the first indication of frost never unclosed at all.

'Last season every marrow was laid separately, and without any straw; thus, owing to the quantity stored, we were obliged to pile them (still with as little contact as possible) one on another, and fearing the intensity of the frost, a little fresh straw was scattered over them. In the first experiment not one perished in any way, and the last were cooked on Old Candlemas-day, and would in all probability have kept two months longer. In the second, out of fifty marrows, about half-a-dozen went off latterly with spots of brown mould, which quickly spread over the

whole fruit, and rotted it. Whether this was occasioned by the excessively wet season in which they were produced and gathered, or by the slight difference in the mode of storing, only a third experiment must decide. However that may be, some yet remain in high perfection at this time, the middle of March. Those stored were all gathered at exactly two weeks' growth between the middle of July and the middle of September; such as attained inactivity later not answering at all to keep. With respect to the best modes of cooking, the recipe for serving them up like asparagus will certainly be found the fittest when fresh gathered, and as long as the skin remains tender; but after long keeping, when that begins to harden, (almost into wood, as it does), the most eligible form of cooking is to peel them as neatly and thin as possible, halve and quarter, or cut into eight, according to the size; throw into a saucepan of rapidly-boiling water (with a little salt or carbonate of soda) for fifteen or twenty minutes, then drain and squeeze gently, for they absorb an enormous quantity of water when peeled, and mash with butter, cream, pepper, and salt, exactly the same as turnip. Thus prepared, they form a delicious and substantial dish; and it will be found, that although they become (some of them, not all) a little stringy towards the last, their flavour is greatly improved by keeping.'

LIST OF PLANTS IN COMMON CULTIVATION FOR THE USE OF MAN AND CATTLE.

Names and Distinctions.	*How Propagated.*	*When Sown or Planted.*	*Remarks.*
CORN CROPS.			
Wheat - -	By seed -	From the end of September to the end of November	Sometimes in the southern counties it is sown in March. The seed sown should be the produce of spring-sown wheat, which ripens earlier than the produce of winter-sown wheat. The yield in straw and grain of spring-sown is less than that of winter-sown wheat.
Rye - - -	Ditto -	Generally ditto;—occasionally in March	
Barley - -	Ditto -	From the end of March to middle of May	
Bere or Bigg - -	Ditto -	Generally in September and October	It may also be sown in any of the spring months. It is an inferior sort for malting, but hardy and ripens earlier than the parent kind.

LIST OF PLANTS—CONTINUED.

Names and Distinctions.	*How Propagated.*	*When to be Planted.*	*Remarks.*
Oats - - -	By seed -	From middle of March to middle of April	
LEGUMINOUS.			
Pea - - -	Ditto -	Generally from the end of February to end of May	The early frame may be sown in gardens in November.
Bean - - -	Ditto -	Ditto	A winter variety of horse bean is sown in October and November; it ripens a fortnight earlier than the ordinary field sorts.
Kidney Bean - -	Ditto -	From end of April to end of June	
Vetch or Tare - -	Ditto -	From March to June, and from September to middle of October	

LIST OF PLANTS—CONTINUED.

Names and Distinctions.	*How Propagated.*	*When to be Planted.*	*Remarks.*
BRASSICA or CABBAGE TRIBE.			
Headed Cabbages -	By seed -	During the whole year, except the winter months	The seed of nonpareil, early York and other headed sorts may be sown in June and July, and planted out until the end of Nov. for coleworts in spring. The seed of Savoy for winter use should be sown in April or May.
Brussels Sprouts -	Ditto -	March	
Borecole - -	Ditto -	From 1st of May to June	
Scotch Kale - -	Ditto -	March	
Jersey Kale - -	Ditto -	August and early in Sept.	
Cauliflower - -	Ditto -	From May to September.	The seed may be sown in a hot-bed in October or November; the plants should be put into frames for the winter.
Cauliflower Brocoli -	Ditto -	April and May	The cape broccoli (which is an excellent sort) may be sown in April or May.

LIST OF PLANTS—CONTINUED.

Names and Distinctions.	*How Propagated.*	*When to be Planted.*	*Remarks.*
Rape	By seed	March and April	
ESCULENT ROOTED.			
Potato	By tubers	From middle of February to end of April	
Jerusalem Artichoke	Ditto	March and April	
Turnip	By seed	From middle of March to middle of August	The early green (garden) sort first—the yellow Aberdeen and Swede in May and June—and the stone in July and August
Carrot	Ditto	March and April	
Parsnip	Ditto	From end of February to end of April	
Radish	Ditto	From January to August	The first sown will require a moderate hot-bed and protection from frost. There are varieties suited to the seasons.
Garden Beet	Ditto	April, May, and June	
Field Beet	Ditto	April	

LIST OF PLANTS—CONTINUED.

Names and Distinctions.	*How Propagated.*	*When to be Planted.*	*Remarks.*
CULTIVATED FOR THE LEAVES ALONE.			
Spinach - -	By seed -	March, April, May & August	May be sown in Sept., a hardy sort—for winter and spring use.
Lettuce - -	Ditto -	From February to July	
Cresses, &c. - -	Ditto -	From March to November	
Endive - -	Ditto -	From June to middle of Aug.	
BULBS.			
Onion - -	Ditto -	From end of February to end of March	If the seed be thickly sown late in March, the bulbs taken up in September, when of the size of small pickling onions, and planted in February following, will bulb largely in July.
Leek - -	Ditto -	March	
Shaliot - -	By seed and dividing roots -	If by seed, in March; if by dividing roots, in April	
Chive - -	Ditto -	Ditto	
Garlic - -	By dividing the bulbs	Ditto	

LIST OF PLANTS—CONTINUED.

Names and Distinctions.	*How Propagated.*	*When to be Planted.*	*Remarks.*
CULTIVATED FOR THE FLOWER, HEAD or STEM.			
Artichoke - -	By offsets -	April	
Asparagus - -	By seed and roots	March and April	
Sea Kale - -	Ditto -	Ditto	
Celery -	Ditto -	From 1st of March to end of May	
Rhubarb - -	By seed and dividing roots	March	The petioles of the root leaves are the portions commonly used
CUCUMBER & GOURD TRIBES.			
Cucumber - -	Ditto -	April and May	This requires to be raised by seed in a hot-bed.
Vegetable Marrow -	Ditto -	Ditto	Ditto.
Pumpkin - -	Ditto -	Ditto	

LIST OF PLANTS—CONTINUED.

Names and Distinctions.	*How Propagated.*	*When to be Planted.*	*Remarks.*
GARNISHINGS AND SWEET HERBS.			
Parsley - -	By seed -	March and August	
Horse Radish - -	By planting crowns and part of root	February and March	
Fennel - -	Ditto and offsets	Ditto and April	
Mint - - -	By seed or cuttings	If by seed, in March; if by slips or cuttings, in March or September	
Sage - - -	Ditto -	Ditto	Chamomile and other medicinal herbs are freely propagated by parting the roots or by slips from the offsets.
Thyme - -	Ditto -	Ditto	
Balm - - -	Ditto -	Ditto	
Rosemary - -	Ditto -	Ditto	

COTTAGE FARMER'S CALENDAR.

JANUARY.

We shall take for granted that every part of your field intended for cropping has been already dug deeply and roughly, and either ribbed or ridged up to expose the greatest surface. On stiff land thus exposed, the action of the frost will be more useful in loosening it than weeks of labour. If water rests on the surface, this is a certain proof that draining is necessary; and until this be done, nothing can proceed profitably or with satisfaction to the cultivator;—drain, then, without delay.

The earth, at the beginning of this month, is almost in the deadness of slumber; this is, therefore, a convenient time for cutting drains. These should be made from three to four feet deep, and from eighteen to twenty-four feet apart in thorough draining, according to the quality of the undersoil and the circumstances under which wetness affects the land. The old practice of running drains directly across or aslant the inclination of the land was wrong. Let the drains be in the direction of the slope.

When they are dug, cleared out perfectly, and levelled, begin at the higher part of the drains, and throw in stones not larger than a pigeon's egg, or coarse gravel carefully screened, to the depth of eight or nine inches; cover these materials with a tough sod inverted. Then throw in the undersoil which was last dug out, lay the surface earth over this, making allowance for the sinking of the filling, and scatter the re-

nainder over the field; however bad its quality, it will become fertile when under the influence of the atmosphere and manures. No treading in of the clay over the stones is necessary, its own adhesiveness and closeness will prevent any water from running downward through it into the stones and choking them with particles of earth; the water will trickle from the sides of the drains into the drain. Where stones are not abundant, pipes, evenly placed and covered at the joints with thin turf, as in the other case, are the best substitutes; and if no better material can be afforded, faggots of brushwood, covered with tough sods, will answer well for many years. The principal effects of draining are, the facility given to the filtering of water through the soil and the passage of air, the loosening of the land for the spade or plough, its increased warmth, especially at those seasons when the rapid evaporation of moisture by the sun or wind chills the earth and its vegetation,—an earlier season for sowing, and much more facility in the harvesting of late autumnal crops. In a word, an increased produce of one-third may be confidently expected from a judicious thorough draining of clay soils, and the removal of springs from any soils.

Keep the mouths of all drains, ditches, and furrows free from lodgment of water, and for this purpose take care that your outfall is sufficiently below their level.

Trim and plash edges. Plant thorn quicks, after properly preparing the soil for them. Shorten the stems of the quicks to about six inches from the roots and plant them either upright in the usual English way, on a strip of raised mould, or horizontally on a sod laid in the Irish manner for the ledge of a bank fence.

If the ground be hard, wheel out dung and the scourings of ditches for composts, and mix the materials as soon as possible. Turn and mix composts that have been previously made. If you raise a dunghill in the field, cover it with some of the surrounding earth. This crust prevents the escape of the

volatile substances of the dung. You may make a very good compost without any dung—reserving this for the crops which must have putrescent manures, thus :—

Make a platform of sods or mould six inches thick, twelve feet wide, and of any length. On this bed spread quick-lime about three inches thick. Let the lime be then not only slaked, but moistened well with a solution of salt, in the proportion of at least 7 lbs. of salt to half a hogshead of water, and pour this solution gradually and evenly on the lime accordingly as the lime imbibes it. Then spread a layer of mould over the slaked lime four or five inches thick, and over that again another course of lime, to be treated in the same manner, and so on, until you have accumulated a sufficient mass of compost. If the soil of a headland be applied for this purpose, one or two courses of earth and lime will be more convenient. When the last layer of earth has been put on, let the whole be cut through and well mixed, in which state it should lie until a short time before it is to be used, when it should be turned again. The chemical combination of the salt and lime produces new properties of fertilization.

Fork the ground about your cabbages and other growing crops, and earth-up young peas, &c., if you have ventured to sow them in November. Never sow too soon as a general rule. Be guided by the state of the land, of the weather, and of the usual climate. Do not try to force a season. The cottager cannot afford loss of time or seed; unless he has a very profitable market for early productions, he will find that crops sown or planted at the natural time will be much more productive and certain than those sown before their time. The later sown ones overtake the former in growth and ripening nine times out of ten.

Employ some of the long evenings in tying reed-straw together for matting, to protect your early garden productions from frost, and in repairing tools, &c. Spinning flax and wool ought to occupy much

of the time of the females of your family; and every thing which tends to the education and moral improvement of the household should be a principal consideration in the employment of the long winter nights of this month.

FEBRUARY.

Go on with your draining. Spare no pains to collect manure, and let none of the urine from the cattle-sheds or dunghill be washed away by the rains which often fall so copiously during this month. A water-tight cask, sunk in the ground, will form an excellent substitute for a cistern. Some economical cultivators construct a flagged or tiled trench the whole length of a sheep-house, in which the excrements and droppings from the sheep are received through a wooden grating on which the animals rest. Sometimes, to save litter, the sheep lie on the bare grating, but where litter can be afforded to them, it is mistaken economy to keep them without it, for it is by means of animal excrements that the fermentation and decomposition of litter is properly effected. Putrescent manures (those produced by animal and vegetable substances combined) enrich the soil more than other manures. Guano, bone-dust, and most of those concentrated manures, which under certain circumstances are beneficially applied, stimulate the soil so much that its exhaustion succeeds. The immediate crop consumes all the elements of food contained in the manuring substances; whereas the durable effects of farm-yard dung, abundantly supplied, are plainly discernible, not only by the increased amount of that rich vegetable mould termed *humus* (distinguished by the dark colour of the soil) but are experienced in the productiveness of crops succeeding in judicious rotations.

In the southern parts of Great Britain and Ireland, the sowing of horse-beans proceeds during the course of this month, if the land be in a fit state. There are two modes of getting the beans into the ground.

to be recommended viz., by dibbling them, according to the Berkshire practice, in rows 16 or 18 inches apart, and at distances between the holes of 8 or 9 inches, or by sowing them in the Scotch manner, in drills from 27 to 30 inches asunder. Dibbling is the most economical system for the cottager, who, with the assistance of two or three women, can dibble an acre in a day. Put only three or four beans into each hole. Ley, with one ploughing, may be advantageously brought into a state of preparation for wheat-sowing in the succeeding autumn by cropping it first with beans, the hoeing of which will loosen and cleanse the ground. Old rich pasture land cannot be more expeditiously brought into economical culture than with a crop of beans in the first instance, without manure.

If your soil be dry and climate mild, you may sow oats towards the end of the month. There is no good reason against your dibbling oats seven or eight inches apart. If you do not dibble you ought to drill the seed: the saving of seed will pay for the labour. As a rule, however, thin sowing is not to be recommended except on land in good condition. On worn-out soil, if you sow corn at all (which you ought not to do) sow thickly, whether in drill or broadcast.

Keep the live stock warm and well fed, and do not let the cows poach the land. If you now have sheep fattened on turnips or other roots, and oil-cake, you will probably obtain a high price for them. There is no difficulty in fattening successive lots of sheep in the course of the year, either altogether or partly confined in a shed and folded on the field, according to the season and the food. If you are fattening lambs for the market, give them oats, pea or bran meal, and a little oil-cake to assist the mother's milk. Until furze (whins, or gorse, they are also called) blossom, their young shoots afford rich and excellent fodder for cows and horses. They should be first bruised in a trough with a wooden pounder, having a sharp bar of iron at its base. They may be mixed

with chaff, which will correct their purgative qualities.

Finish your faggoting. Plant osiers and willows in moist situations. The red Huntingdon, or timber sallow, is the best for ornament or shelter, round the cottager's garden, and is useful for many general purposes. The young shoots serve especially for baskets. The green and white Huntingdon is the best for hoops. The ground should have been previously dug to a considerable depth, kept clean, and arranged in ridges, for a plantation of osiers. Take cuttings fifteen inches long from two-year-old wood, and stick them into the ground two-thirds of their length, and at two feet apart every way.

MARCH.

STRONG winds will now dry up the surface of the earth; but do not too hastily sow your seeds. The evaporation of moisture occasioned by the wind or the sun chills the ground considerably; witness the effects of it on wheat plants, more especially on wet clay soils. Finish draining for the season; there is no better month than the present for this work, because you will now be able to see in the strata of the drying soil where the springs rise, or rain water escapes most readily. Give the last turning to any composts that require pulverization and mixing, and are designed for spring crops. About the middle of the month (earlier in warm soils) sow your oats, and do not be satisfied with careless and imperfect preparation of the land, on the plea that oats are more hardy than other cereal crops: the better tillage, the better crop. If the land is rich, dibble the seed as recommended in last month—sowing from 2 to 2½ bushels per acre, or else drill at 9 inches. Pickle the seed first by placing each sack of it separately on the barn floor, and pouring over it (not out of an iron vessel or it will be corroded) a solution of 8 oz. of sulphate of copper (blue vitriol); it will dry of itself

in an hour, and be ready for sowing.—*(Agricultural Gazette.)* The vitriol is supposed to destroy the spores of smut adhering to the grain. The Tartarian oat is to be recommended in bleak situations. "The Hopetoun, potato and Poland oats are good varieties —the first being distinguished by an abundant yield, and good and bulky straw; the second by the quality of the grain, and the third by its earliness."—*(Agricultural Gazette.)*

Sow successions every fortnight of vetches in narrow drills,—3 bushels to the acre. One of the objects in sowing vetches being to smother growing weeds, and shade the surface so as to prevent the evaporation of moisture from it, there will be no bad result from over-seeding. Dibble beans and drill peas, if not yet done, in rows at least 18 inches apart, as early in the month as possible. Plant more early potatoes. Prepare your ground for barley and your main crop of potatoes at the close of the month, either by cross ploughing the ribbed fallows, or by levelling and thoroughly pulverizing the soil to the depth of at least 12 inches with the spade; but do not be tempted to sow the grain or plant the sets until the next month, unless under very favourable circumstances of soil and climate. Prepare the land also for carrots and parsnips, and towards the end of the month harrow or rake your wheat (if you are so bad a farmer as not to hoe it) and roll after harrowing. Pick off stones from the wheat plants, and top-dress with a mixture, in equal quantities, of soot and salt, if you can easily procure it. Lime slaked with a solution of salt and water, and ashes strewn over the surface, will invigorate the plants and preserve them from the ravages of grubs and insects. Top-dress clover with a sprinkling of lime or ashes. Where gypsum is obtainable, use it in preference to other substances: it has a powerful effect on clover; chalk is also a manure very congenial with its nature. Take care of your ewes and lambs, and feed them abundantly.

APRIL.

THROUGHOUT this month sow barley. Experience proves that early-sown grain yields better than that sown later, if the soil be in a fit condition to receive it. Under favourable circumstances of mellowness and warmth, the grain which was sown at the close of last month will probably be more productive than that which, under corresponding circumstances, will not be sown until the close of the present one, or the commencement of May. The favourite kinds of barley for a loamy soil in a fertile state, are the chevalier and the golden drop, each of which is very prolific under proper management. On inferior soils a coarser, hardier, and less weighty sort will be most suitable; for poor land cannot nourish a stem able to bear a heavy ear. As a general rule, in selecting seed barley, take that which is plump, thin-skinned, and of a bright colour. It may not be amiss to remark, that plants brought from genial climates will not thrive on inferior soils and in cold climates; whereas, those which are taken from inferior soils and climates to better, improve. It should, therefore, be the care of cultivators to take advantage of this order of Providence. For example, the coarse-grained barley, called bere or bigg, cultivated in the northern parts of the British islands, will to a certainty succeed in the more southern parts (where it may be prudent to grow it under certain circumstances) and improve in its quality, though a variety of higher quality, such as the Egyptian barley, will as certainly degenerate if removed to a northern climate. There are hardy varieties of oats of established excellence in Scotland, such as the Angus or Hopetoun, which, for the reason just assigned, will be desirable for the English grower whose soil and climate may render the success of the finer kinds doubtful. Provide the seed best suited to your land and climate, even if you pay what you may consider dearly for it. It is but the first cost, if you save your own seed afterwards. By

observing due economy in sowing it, you will gain more than if you were to sow cheaper seed of less fruitfulness, or yielding a grain for which the maltster has no fancy. Seed that costs little is often wasted in the sowing, merely because it is cheap; and we may add, that it must be sown more freely, if it be at all of uncertain growth.

If you do not dibble your barley or oats, sow them both in drills. With respect to the former grain (for the other ought to be now above ground) the drills should be, in light soils, within nine inches, and in strong, rich, loamy land, at intervals varying from twelve to sixteen inches, according to its mellowness and fertility, and the seed should be covered less heavily in clayey than in loamy or sandy soils. The poorest land requires most seed. The field cannot be too well prepared for barley; therefore a previous crop of manured roots, perfectly hoed and cleaned, will be the best preparation, not only for barley, but for clover-seed, which in most cases should be sown immediately after barley, and rolled with a brush-harrow. The plants will come up freely between the drills of corn, and afterwards spread over the whole surface. Clover-seed is often bad: its germinating powers can be easily tested by this simple process, recommended by the late M. Dombasle, a celebrated French agriculturist;—the same test will evidently serve for any sort of small seeds: put two bits of coarse cloth or flannel, previously wetted, in the bottom of a saucer, one over the other; scatter some of the seeds which you want to prove over this double cloth, and so that no two seeds shall stick together; cover them with a third piece of moistened cloth, the same as the others; place the saucer in a moderately warm spot—as over a fire-place; after a few days, examine if the uppermost cloth is beginning to dry up; if so, moisten it, so that the three pieces may imbibe moisture; but as the seeds would rot if they were soaked in the water instead of being merely in a damp state, you must drain off the water which has

not been absorbed by the cloths, by inclining the saucer to one side. To watch the daily progress of the bursting grains shooting forth their germs, or detect the mouldiness which, in some cases takes place very quickly in seeds that have lost their vegetating powers, you have only to lift up the upper piece of cloth, by which means you can easily judge whether old grains have been mixed with the new, as these germinate much more rapidly; and you can thus ascertain in what proportions your whole quantity of seed is defective. The seeds of clover, lucern, and lettuce sprout on the third day, if they be fresh and healthy. Other kinds take longer time, but until mouldiness appears, the seeds are capable of germinating. By squeezing one or two seeds between your fingers, you will see whether the germ be still sound or not; if it be sound, wait longer. Some seeds preserve their germinating powers so long, that is is not necessary to have them fresh, a matter of which seedsmen are well aware. Sow mangold würtzel (cattle beet) in drills, well manured, twenty-six inches apart, and drop the seeds on the top of the drill when rolled, ten inches apart. Plant potatoes, but not so extensively as *to depend* on them for food—the failure may occur again. In most cases the cottager plants the sets too thickly. For the late kinds let there be from two and-a-half to three feet between the rows. If there be not room enough for the stems to grow out freely, and the roots to stretch forth, and the air to penetrate through the foliage, there will be a poor crop. In land deeply dug, and with manure mixed through it in the digging, nothing more is necessary than to draw the line and dibble in the sets. If these be uncut, and of middling or large size, they should not be closer than fourteen nor farther than eighteen inches asunder in the row; if cut, nine inches apart. But the most usual way is to open drills, put manure into them, lay the sets on the manure, and then cover them up from the earth at each side; or the sets, cut or uncut, may be laid with equal effect in dry land

over the manure; there will be no perceptible difference in the produce. But under any circumstances, let the soil be deepened to the utmost, and perfectly pulverized.

The cultivator who depends entirely on his spade for preparing his land, may sometimes find it difficult to dig the whole piece over in due time for commencing the planting of potatoes, Jerusalem artichokes, cabbages and other crops which are sown in drills, from two and a-half to three feet asunder. In such cases he can dig, in the first instance, strips wide enough to receive his plants or seed, as the case may be; and afterwards, as time permits, and the necessities of the growing plants require, he can complete the digging. This, in potato planting especially, where circumstances may have unavoidably hindered the regular and early execution of the work, may be a useful hint. Fresh stable litter answers well for potatoes, and composts of any kind are also suited to them. But in no case will they grow more luxuriantly or be better for the table, than when grown on land previously limed, chalked, or marled, and also lightly dunged at the time of planting. The chief elements of the food of the potato are contained in those putrescent and mineral substances. It is a foolish thing to reserve the refuse of potatoes for seed as the poor are sometimes tempted or obliged to do. Endeavour to obtain seed potatoes of medium size, and of the best variety known in your locality.

MAY.

In the course of this month you will probably have completed the second hoeing of your wheat and winter beans. The first hoeing should have been executed in dry weather during the preceding months. The greater regularity and ease with which drill crops can be hoed, is one of the reasons why the broadcast system should be abandoned. Weeds should never be permitted to grow through your crops; they not

only exhaust the elements of fertility contained in the soil, but check the progress of the cultivated plants, and render the land foul for succeeding ones. If you do not see weeds flourish on the surface, you will assuredly find them beneath it, if you use your hoe. Couch is a sad tormentor, which you should endeavour to get rid of. It particularly infests land which has been under successive and ill-hoed corn crops, and is in fact a wild wheat plant, and called *triticum repens*, from its creeping nature. Every joint or *stole* of it shoots forth, like that of the convolvulus, which is the plague of gardens; and therefore it should be cleared out entirely, but without regular and frequent successions of green crops, it is impossible to get rid of it; with perfect culture, however, it disappears. Its presence, therefore, is generlly a certain proof of imperfect tillage. Burn every atom of it when you have collected it, as the surest mode of destroying its vitality.

Lucern ought to be cultivated much more than it is, on loose calcareous soils. Its exceeding value is well known in the chalk soils of Kent, but in other English counties it is almost unknown. The ground should be well prepared for it by previous cleansing crops. It is generally sown broadcast in France, but it ought to be sown in drills about sixteen inches apart, in order to admit of weeding. As it is tap-rooted, and will penetrate many feet into the soil, and produce three and even four cuttings every year, if manured, it is important to have a dry and free subsoil for it. The only objection to it on a very limited portion of land is, that wherever it is sown and established, it usually remains for ten or twelve years, thereby preventing rotations on the space it occupies. But it is so nutritious a plant, so greedily devoured by cattle and pigs, and so luxuriant in produce, that no occupier of deep loamy or any porous *calcareous* soil should hesitate to give up some enclosed portion of land to it. In the driest weather, when all surrounding vegetation is withered, lucern is

green and flourishing, absorbing the necessary moisture from the depths below. It is only one-third less nutritive than carrots, and has more than twice the nutritiveness of white beet: 80 lbs. of it, green, is enough for the largest cow during twenty-four hours, and 40 lbs. for a horse. It should never be grazed, for the nipping of the crown is a mortal injury to the plant. The sowing of barley or clover may still proceed in the beginning of the month, as also that of the long red or field carrot. In the northern parts of our country, the sowing of barley and the planting of potatoes is still seasonable. After the second hoeing of beans, rape seed may be beneficially scattered over the ground as a bite for sheep in the autumn, which by their manure give an ample return for the trifling exhaustion of the land occasioned by the young rape plants. Sow another succession of vetches if wanted. Roll wheat and every other crop that requires it,—not omitting grass land. Do not be tempted to turn out your cattle,—feed them in house on the green rye and every sort of artificial and seasonable food that you can procure for them.

JUNE.

THIS is the favourite month for sowing Swedish turnips, which are greatly prized beyond all others for solidity and hardiness, and for the excellence of their leaves as greens, in spring. Being tap-rooted, however, they require a deeper soil than the globe sorts; but they repay any labour bestowed in the preparation of the ground, and the liberal allowance of dung or compost which they certainly require. Let them be grown in drills twenty-six inches apart. The common practice of crowding the plants is a false economy, for if the leaves have not free space for expanding, the growth of the whole plant is checked, and a stunted production is the consequence. A sprinkling of soot will prevent the fly from attacking the young

plants, and ashes are a manure congenial with the nature of all turnips, but the solid and weighty Swede requires more nourishment than mere ashes can supply. If dung be scarce, bone manure is the best substitute. Let the crushed bones or dust be mixed with the dung, and the mixture may thus be rendered sufficiently powerful to manure the required extent of ground. Though potatoes will succeed perfectly with fresh litter as manure, turnips and mangold würtzel will not; they (particularly turnips, which vegetate rapidly) require short well-rotted dung, or compost of dung and earth, almost in contact with the seed. This is a good season for burning weeds and the undersoil of headlands and peat, for any turnips or cabbage-seeds that are to be sown now or in the next month. Sow a seedling bed of Swedes, common kale, or rape, according to the nature of your land and your future wants, to supply any vacancies that may arise from failures in your regular crops. Consume as much of your vetches, clover, &c., in the *green* state as possible: thus will the mass of manure be increased. 'Make hay while the sun shines.' The less a very small occupier has to make of it, however, the better. Do not wait until the grass seeds ripen, else both the soil and crop will be injured; and do not expose the mown grass to more sun than is necessary to its preservation. Clover should not in ordinary cases be strewn over the ground, but left in *swath* and merely turned over or kept in lap cocks until it is put together and sweated.

JULY.

As fast as vetches are cleared away, break up the ground for stone turnips, or cabbages of the drumhead or large Strasburg kinds. Cabbages may succeed early potatoes if a little fresh manure be added to the ground, or a supply of *liquid* manure, can be abundantly afforded at least twice after they have been

transplanted. This liquid manure will of itself be sufficient to ensure the success of the crop, and there can be no better season for collecting it from the house-fed cattle than now, when succulent food for them, is abundant. The cabbages, of the above sorts, ought to be put down four feet apart, every way. Cabbages, steamed or boiled, and mixed with salt and bran, will be found of great value for pigs and cattle; they should always be given to the latter sparingly, either raw or after immersion in boiling water, which prevents flatulence; treated in this way, every part of them is eaten with avidity by the cattle. By putting a little nitre into the milk-pail, before the milk is drawn, no bad flavour will taint the milk. A little of the same corrective substance may also be put into the churn.

The great object of the farmer ought to be, to keep his land under constant cropping, and especially with a view to cattle-feeding in the house. The preparation of the ground for cabbages, or transplanted swedes, (if manure be available for these,) will *tell* in a succeeding crop of wheat, whether sown in December, or in spring—or of barley with clover, which will probably be preferable.

In any of our dry warm counties, a patch of buckwheat may now be sown. It will be found beneficial for poultry. It should be sown at the rate of a bushel per acre, on ground in good condition. The French manure for it, and consider it a good preparation for wheat. As it runs its course of growth and maturity in three months, it will ripen in October, which is often a very fine month in our country. This crop, by shading the ground and smothering weeds, acts, in this respect, as beneficially as vetches. Top bean-stalks, and take off potato blossoms; these operations increase the produce greatly. This is the chief season for rearing pigs, which the green food and the refuse of the dairy will assist to keep in good growing order until the time comes for fattening them.

Either the stone turnip or *Trifolium incarnatum* may be sown after a wheat crop, if this be reaped at the end of this month, or before the 10th of September. A light ploughing and harrowing (or hoeing) will sufficiently clear the ground of stubbles and weeds. The seeds then are to be sown, and covered by a light seed-harrow. If the ground be in good condition, the additional crops thus obtained will amply repay for the labour; the part under turnips will be cleared off early in spring for barley, and *Trifolium incarnatum*, after supplying a very valuable green food in the early summer, will be consumed in time for a turnip crop. Hoe all the root-crops that require thinning; and clean and loosen the ground about the roots, for which purpose a three-pronged fork will be found useful. Fill up from the seedling-bed, or from the thinnings of the hoed crops (if the plants be stout enough for transplanting), whatever vacancies may be in the main crops, taking care to loosen the earth deeply and perfectly for them, and to manure the roots and water abundantly. The late potato plants should be kept very clean; in ordinary cases earthing is beneficial to potatoes, but in very thin soils, and especially if the drills be close, high moulding is impossible in such case; if the spade or fork be sufficiently used for loosening the earth in the intervals between the drills, this is all they will now want. In land liable to the lodgment of water, high earthing is quite necessary, to form furrows as drains; but land so circumstanced is very unfit for the potato, or indeed for any other cultivated crop. Turnips are decidedly injured by having their bulbs earthed up; these require to be freed from the adhesion of earth.

The value of clover and lucern is now being experienced: "cut and come again," is their motto. A top-dressing of ashes, soot, or of lime and earth mixed, or a watering from the urine tank, will stimulate them greatly. On them now chiefly depends the requisition

of solid and liquid manure. It has been calculated that the liquid manure saved from each cow is worth eight shillings a-year, and that the urine of six cows is sufficient for an acre of land, without the addition of any other substance. How much better then is it at the present day to keep cows, sheep, and pigs, (all which give a return to the soil for what they consume of its productions, in manures, and produce by milk, butter, and meat, a money profit sufficiently high) than to grow corn for the *market*. It is worth remembering in these times, that in Belgium, noted for its admirable husbandry, wheat has been long considered as of less value than flax, hemp, colza, roots, and clover, and only to be cultivated as a means of supplying the farmer's establishment with bread, and for the sake of straw. But when straw runs short—as it will if there be only enough of grain sown for domestic purposes, and the fattening of pigs and poultry,—rushes, heath, ferns, damaged hay, &c., and seasand, are in many cases substitutes easily attainable for bedding the cattle; and if these fail, Mr. Huxtable's boarded floors, with the economical etceteras recommended by him, may supply the deficiency.

SEPTEMBER.

THE SAVING OF CLOVER SEED.—The second crop of clover is that from which the seed is usually obtained: this is the time for saving it; the first crop ought to have been cut early, in order that the second should mature its seed in the proper season. The difficulty of saving clover seed in the very damp parts of Ireland and Scotland, occasions a great demand for that saved in the drier climate of England. If fermentation should take place in the rick, (and it is difficult to avoid this in an atmosphere loaded with moisture), the seed is of course spoiled. The treatment, therefore, of clover hay of the first crop is different from that of the second, if designed for seed. In the first case, due fermenta-

tion is promoted, by which the hay is rendered odoriferous and more nutritive than it would be if it did not heat, and in the second it is avoided as destructive to the seed. In parts of Belgium, the ripe heads of the clover are frequently pulled off by the hand and carried to the barn in bags; the stems are then mown and converted into hay in the usual way. To little farmers, such as those in Ireland and Scotland, who require but a small quantity of seed, this is a simple and very certain method of obtaining prime seed, for it may be immediately protected from rain, and dried if necessary on the floor of a shed; but in a climate where all the seed may be saved with reasonable certainty, and afterwards sold to farmers in less favoured localities, it must be much more beneficial to save the entire seed produce.

TRIFOLIUM INCARNATUM.—On stubble land, in clean and generally good condition, the seed of this valuable plant of the clover tribe may now be sown; no ploughing is necessary for it, the harrow or rake (the latter for the cottager) will cover the seed and open the soil sufficiently. From fourteen pounds to twenty pounds is a sufficiency of seed for the acre. Where the spring-sown clover has failed in patches, trifolium incarnatum should be sown; this will not only prevent the occupation of the waste spaces by weeds, but supply a valuable substitute for the clover. This hint is well worth acting upon where partial failures of clover have disappointed and embarrassed the cultivator.

TARES.—Sow these on stubble land properly prepared by the plough or the spade, and manured, if no manure had been given to the previous corn crop. Four bushels of seed, if drilled, will be an ample allowance to the acre; a bushel less, if the tares be intended to bear seed. When leisure hours permit, cart out manure on land intended for wheat, and take care not to allow any of the hedge weeds to shed their seeds; the trimming of hedges, and the collecting of weeds, either for the pig-yard or for burning, should

not be neglected. Every early kind of the potato will have been long since ripe. Those tubers which have been left in the ground for next year's supply of seed, should be taken up when the soil about them is dry, and either laid in a *dark* cellar on a dry floor, or collected on a dry spot of the field rather raised above the level of the surface than sunk below it in a trench as is the too common practice. Towards the *end* of the month, some of the late kinds will be fit for securing in the same manner; but care should always be taken not to lift the potato crop for stacking or storing unless it be quite ripe, that is, until the haulms are perfectly withered, and the tubers fall off from the roots on the slightest movement of them. Many persons who have but a small portion of field under the potato crop, place a layer of reeds or sedge over it during the winter to guard against frost; and where winters are mild, this is a better plan on very absorbent soils than stacking the potato crop in heaps, in which they often become rotted. A *heavy* covering of earth shovelled towards the approach of winter over any ground bearing a potato crop would be, in many cases, the most effective preservative of the potato in the winter season. Pull the drooping leaves of cattle beet for cows and pigs.

OCTOBER.

THE sowing of wheat on clover leys, fallows, &c., is now to be commenced. A previous dressing of quick lime will have been the best preparation. Where farm-yard manure has been applied instead, it ought to have been ploughed into the ground immediately after being put out. Some slovenly farmers are in the habit of letting it lie for many days in small heaps on the land, as if they were desirous of getting rid of the best properties of the manure. In *rainy* weather, indeed, the loss is comparatively trifling, if the manure be left on the surface, especially if it be spread over it, in which case the soil imbibes the valuable

substances washed from it; but in very dry weather, the waste of exposed dung is considerable. No cultivator who understands the properties of putrescent manure, will leave it unmixed with the soil an hour longer than he can avoid doing so. In Ireland, where so much deficiency in farming is observable, this particular negligence is not seen, because the English practice of applying putrescent manures to wheat is scarcely known there. Lime, or compost of lime and earth, is the favourite manure for wheat in that country, where all putrescent manures are reserved for the potato and turnip, or other such root crops exlcusively. The quantity of seed wheat wasted, even by some of the best farmers in England, is enormous. Storms lay prostrate many fields of wheat because they have been too heavily seeded; the roots being crowded together, want feeding room, or space for expanding and taking firm hold of the soil, and therefore the stems are too feeble to bear up the ear when violent rain falls upon them. Instead of destroying rooks at the time of sowing, and the first appearance of the plants, for picking up grains along with grubs and worms, which are their principal food, and which those supposed thieves are most serviceable in destroying, it would be better for the farmer if he would encourage them to take away one-third of the seed he sows. Even where the drill machine is used, the quantity of seed sown is too abundant; the breadth between the drills is usually too narrow, and the portion of seed dropped in the drill too great.

THE DIBBLING OF WHEAT cannot be too strongly recommended where labourers are numerous, and the cry for employment consequently urgent. On a very minute scale, the practicability and economy of this mode of sowing cannot be denied; and experience is beginning to show that dibbling may be executed most beneficially on a large scale too. We may mention (on the authority of the *Daily News*) that in one of the allotment gardens of Horsham, one-eighth of an acre was equally divided; one part was sown

broadcast with wheat at the rate of two bushels of seed to the acre; the other was sown with seed dibbled at the rate of two gallons to the acre. The part dibbled produced at the rate of thirteen sacks to the acre; the other produced at the rate of ten sacks to the acre. On a very large scale we have known *one-third* more of produce to have been obtained, on an average of ten years, from dibbled than from broadcast-sown wheat. The practice, however, of thin sowing is only to be recommended on land in a high state of fertility and tilth. In such favourable case, the holes for wheat may be made fifteen or sixteen inches apart every way: seven or eight grains should be dropped in each hole; experiments have shown that the greatest produce has been obtained when seven grains were sown in each hole, the distances being the same in the different cases. The facility of hoeing between the plants, and thus promoting their free tillering, and of weeding the ground, is a principal benefit obtained by dibbling. The most efficacious and safe steep for the seed is sulphate of soda and lime. Next to this, steeping the grain in salt pickle, strong enough to bear up an egg, is to be recommended.

Harvest your late potatoes, when the haulm is quite withered, and the land is in a dry state for forking out the crop. The practice of making a pit for the tubers in the field should be abandoned. They should be laid rather on a raised platform than on a sunk bed, in order to keep them dry. The withered stalks, even if free from disease, should not be laid over the tubers, as they soon become damp and mouldy. A covering of earth alone over the *pyramids* of tubers (which will be the better for a sprinkling of dry coal ashes) will be a sufficient protection for them. A dry floor, however, in a cool situation, and without light, is preferable for them to any sort of heaping in the field. Tainted should be carefully removed from sound tubers.

CATTLE AND PIGS will derive much food this

month from cabbages, which may be considered the first course of the winter dietary. Towards the end of the month, turnips, and the large leaves of cattle beet and the tops of carrots and parsnips will be added to their fare. The tailings of corn and fresh barley-meal will prepare porkers for the table. Let there be a steady resolution to keep all the live stock in confinement. It should be remembered that the same quantity of land which will feed one beast in pasture will feed three all the year round in house, and produce nine times as much manure.

NOVEMBER.

WHERE wheat sowing on clay land is still going on, it is of great importance to take advantage of a dry state of soil, as the treading of the land when in a wet state is very injurious. It is better to postpone sowing—whatever be the mode of sowing—until the weather be favourable: forcing a season is rarely attended with success. It is better to be late in sowing if a good condition of soil be thereby obtained for the reception of the seed, than to sow at an earlier period—if the land be then clogged—for the mere object of gaining time. In Ireland, since the almost general abandonment there of naked fallows, wheat sowing is usually deferred until after the removal of the potato crop at the end of the last, or the commencement of the present month, according as the weather may be open or disposed to frost. 'The dark days of November' have been proverbially the season for wheat sowing in that country; but, though darkness promotes the germination of all seeds, there is no satisfactory reason on this account for delaying the sowing of wheat beyond Michaelmas, if the land be ready to receive the seed, because the covering of earth that it receives is a sufficient protection to it from the influence of light, which always tends to prevent seeds from undergoing the chemical process necessary to the starting of the germ into life.

There is a fixed opinion among even enlightened Irish farmers, that a heavy covering of the seed gives the future roots more fixity in the earth, and therefore imparts more vigour to the plants. In consequence of this notion, the practice in Ireland is to plough the seed wheat in the fallow land, or to cover it by spade and shovel with the soil raised from the narrow ridges on which it has been cast. The fact is, that a covering of from one and a half to three inches of earth—according to the nature of the soil—is a sufficient depth for grains of wheat. The lengthening of stem below the surface gives no additional fixity to the roots, which naturally take a due hold of the soil, even though the grains be laid very near the surface; the downward tendency of the roots and the upward tendency of the stem are matters of certainty if the seed grows.

If slugs begin to attack the young wheat plants, turn a flock of ducks on the field at day-break and in the evening: this will have the double effect of fattening the ducks and of clearing the land of the nasty thieves. If ducks cannot be procured, turnip leaves should be strewn over the wheat in the evening; they will be found on removal in the morning to have attracted the slugs.

Sow rye for early soiling in spring; and bigg, or winter barley, where this grain answers.

Get in carrots, parsnips, and cattle beet. The globe varieties of the turnip will have been fed off by sheep or stoted, to clear the ground if it be wanted for wheat; but where barley is to follow, and Swedes are the turnip crop, these should be reserved in the ground for the spring keep, and may be left until spring.

Draining.—Draining of every description should now be carried on when the weather permits. This is the time for thus preparing for next year's cropping. If this work be neglected, under any pretence, where it is necessary, a poor harvest from the undrained soil may deservedly be the return next year.

If the land be worth holding at all, it should be treated in the best manner. The occupier of land diseased from moisture, who has the means of draining and yet will not drain, does not deserve to prosper.

No unploughed stubbles should be seen in this month. Furrows should be kept open.

CATTLE.—All young stock should now be brought into the straw-yard, and the rest should be in byres or boxes, or sheds, as the case may be.—The Christmas markets must be supplied, and the fattening of all animals destined for them should be assiduously attended to.

DECEMBER.

DRAW turnips and house them when you can in order to have a sufficient supply for the cattle in case of very severe weather, which would render the lifting of the turnips, day by day, difficult. Wheat may still be sown in open weather on land which could not be prepared at an earlier period. Commence the ploughing of ley; its exposure to winter frosts will greatly promote its decomposition. Continue or commence to dig, if you cultivate by spade labour, every pole of ground which you want for spring crops. Subsoil or trench as much of your land as you possibly can. If you find that heavy rain washes the finer particles of earth from the higher to the lower parts of a fallow, by the furrows, take this as a hint to drain the land immediately. With a free subsoil, this washing away of the surface will not take place in any part, unless it be very much inclined; the rain will filter downwards where it falls, and fertilize the surface equally.

Collect the earth of ditches and headlands for mixing with fermenting manure, or with quick-lime, or sea-sand and sea-weed. In the vicinity of the sea-coast, the farmer looks for some of the precious treasures of the ocean as the chief sources of his manure. A bed of sand or mould should be collected to receive

the juices of "the fat sea-weed," when storms wrench it from its natural bed, and drive it on shore for our benefit. Every thing that can be converted into manure should be industriously collected, and the short day hours of this month, when the earth is almost at rest, should be unceasingly employed in such field labours as the weather may permit to be executed. The trimming and plashing, or cutting down of old straggling hedges, and faggoting, will be among the out-of-door labours; and threshing, winnowing, chaff cutting, and the repairing of implements, will give full employment within-doors. The farmer or cottager who has grown flax for domestic use, will find some work in preparing it for the hackle; and after it has been hackled, some of the females of his family will find amusement and occupation in spinning it for linen, when they have nothing better to do. The bruising of furze for horses and cattle will be found highly beneficial where economy of hay and straw is important. Milch cows thrive well on it, and it renders horses sleek; but being of a relaxing nature, oats should be given alternately with a feed of furze to them.

There may be occasional employment also found in sorting potatoes among which unsound ones are intermixed. By cutting off the rotten parts, and *grating* the remainder, after washing them perfectly, a good deal of starch may be obtained. The grated matter should lie in water, two or three times renewed, (after the refuse has been strained off), and then dried in the sun or before the fire. It becomes as white as snow, and may be used for any of the purposes for which tapioca or arrow-root is useful, or for confectionery, or as common starch for linen, &c.

THE GARDENER'S CALENDAR.

JANUARY.

KITCHEN AND FRUIT GARDEN.—With the commencement of the year, the kitchen-gardener's business receives a stimulus which, properly followed up by his own exertions, should urge every operation into a forward state. In frosty weather, manure should be wheeled upon vacant ground; and when rains prevent working out-of-doors, the shreds, nails, sticks, labels, brooms, and a thousand other things certain to be wanted, may be got ready, so that on favourable occasions for out-of-doors occupations no time may be lost. Digging and trenching should be completed as quickly as the weather will permit, as after this month each succeeding day will bring its own work; all the ground turned up at this season that is likely to lay unoccupied for a few weeks should be thrown into ridges, and even that intended to be sown immediately with large seeds will be benefitted by the method, as it presents a larger surface to the action of the weather, and ultimately breaks down in better condition than such as has been dug flat. Upon a south border, or some warm part of the garden, a crop of peas and beans may be got in; of the first, the kind called the early frame is the best for this sowing,—it is known in various parts of the country as the double blossom, hotspur, nimble, dwarf frame &c., but they all relate to the same variety. Of beans, the long-pod should be sown now, the rows of each at least three feet apart, and then a crop of spinach or young cabbage

plants may be placed between, to come off before the peas or beans are fit for gathering. If early radishes are desired, sow a small bed under a south wall or fence, and cover with straw; a sprinkling of lettuce should also be sown under a hand-glass, and a small bed of York or other quick-growing cabbage, will be found highly useful for planting out in March and April. Horse-radish is a very useful and profitable article in light soils; the beds will now require renewing. Open a trench at one end, deep enough to get quite to the bottom of the roots, and take out a breadth perfectly clean; reserve the strongest for use, but cut off the crowns of the smaller ones, and plant them in lines at the bottom of the trench first opened, throwing the earth as it is taken from the old plants over the new sets; if there are not sufficient crowns obtainable, pieces of roots cut to about two inches in length will answer equally well. Earth up celery to the top, to prevent injury from frost. Globe artichokes and cardoons, if they are grown, should receive similar treatment. Remove the remaining endive to an airy shed, and tie it up, or cover it with a pan to blanch. Sow a small quantity of carrots and onions about the middle of the month, to be used while young; continue to cover successional supplies of sea-kale and rhubarb. Among fruit trees, the pruning of the hardier sorts should be proceeded with, as the weather may permit, and if transplanting is to be done in February or March, let the ground be prepared at once. Dig between the gooseberry, currant, and raspberry trees, apply manure if necessary, and then a crop of coleworts may be taken from the ground without injury to the fruit. Apple or pear trees that are mossy should be pruned close and then scraped, subsequently washing the trunk and principal branches with lime and soot water. Fig trees should be taken from the walls, and after collecting the branches together, mat them up from severe weather. Espalier trees may be pruned and tied to new stakes as requisite.

FLOWER GARDEN.—If alterations are designed of any sort, as much should be done to forward them as circumstances will permit; the ground may be dug, lawns or grass edgings laid, and everything got ready for removing the shrubs or plants as soon as the season will allow of their being taken up. The more tender shrubs should be carefully matted up in severe weather, uncovering again on the re-appearance of temperate weather; such things as china and bourbon roses, laurustinus, bays, &c., are often much injured in spring by sharp frosts succeeding rain or bright sunshine. The tulip bed must be carefully guarded from heavy rains; and carnations, auriculas, and other half-hardy plants in frames will require a good deal of attention to the same end just now; excessive moisture is most to be dreaded. At this part of the year, do not water such things so long as they will stand erect without it, and that the air may not stagnate in the frames, open them every day that it is at all possible, if only for half an hour; rain must of course be excluded, and on frosty nights they must be closed, and the additional protection of a mat or two given as may seem to be required.

WINDOW PLANTS.—The summer flowering plants, such as geraniums, fuchsias, &c., should be kept as nearly dormant as possible, allowing just enough water to prevent flagging, and all the light that can be spared from the more interesting division of winter bloomers; of the latter class, such things as china roses, cinerarias, hyacinths and other bulbs will now be in an active state, some of them flowering and others about to do so; these must be liberally treated with water. Mignonette, however, must be excepted. Above every thing, keep the leaves clean; they are few in number, and feeble in action, but they have yet an important function to perform, and without they are kept as healthy as possible, the plant cannot begin a new growth with the vigour it is desirable it should possess. The pots should be occasionally scrubbed with clean water, but do not paint or other-

wise fill up their pores, for air is as essential to the roots as to the foliage, and no inconsiderable quantity finds its way to them through the sides of a clean pot; with the same view the surface of the soil should be frequently stirred; the process keeps it open, prevents the growth of moss and weeds, and imparts a better appearance. The water given should always be rather warmer than the atmosphere of the room, and rain water slightly heated is the best.

FEBRUARY.

PROCEED with and complete the operations of sowing, planting, pruning, &c., left unfinished last month. If your land is light and dry, sow onions for a spring crop, towards the close of the month; but on coarse and heavy soils it is better to wait till the middle of March. *Plant* beans for a full crop about the middle of the month. Sow peas, radishes, and lettuce, on light rich soils, for the frost will rarely injure them. Transplant cos lettuces of October sowing, in a sunny spot, on rich light soils; do not be afraid of winds and frosts. *Sow* savoys for early planting, also leeks, cabbages, spinach, parsnips, parsley, and carrots. Many of these sowings must depend upon the weather and the nature of the soil. *Plant* cabbages, onions (for seed), shalots, chives, and horse-radish crowns. Get what hoeing and other work you can done in dry days against the busy time of March. Continue and conclude the work of pruning and nailing fruit trees. Plant fruit trees, shrubs, and bushes, also stocks of all kinds for grafting next year: if favourable weather, grafting may be begun at the close of this month.

FLOWERS.—Towards the end of the month, if open weather, transplant pinks, carnations, and other hardy flowers, pot the roots of sweet-williams, candy-tuft, campannla, &c., if not done in the autumn; make and repair box and thrift edgings.

MARCH.

KITCHEN AND FRUIT GARDEN. — Whatever of last month's work has unavoidably been left must now be completed without delay; digging and planting of all sorts must be brought to a close, and active preparations made for filling the ground with seeds. Sowings of peas and broad beans should be made every fortnight, the first in rows from three to four feet apart, and the latter about half that distance. Sow the principal crops of onions, carrots, and parsnips, the first on rich ground, and the others on land that has not received manure this season, but has been well dug at least eighteen inches deep: break the surface level and sow the whole in drills one foot and a half distant from each other. On a warm border the long-rooted radishes may be sown in the early part of the month, and the turnip-rooted kinds towards the latter end; they will do without covering, but must be carefully guarded from birds. Spinach is a most useful article, and should be sown very frequently, between the rows of larger crops, under currant or gooseberry trees, or on any spare piece of ground; it is very productive, and quickly off. An open part of the garden, where the ground is good, should be selected for sowing whatever kinds of the cabbage tribe are intended to be sown. Brocoli, savoys, kale, cabbage for autumn, and cauliflowers should be there sown for transplanting at a later period. For convenience in keeping them clear of weeds, it is best to have them in four-feet beds; and to ensure strong plants, sow thinly if the seed can be depended on, or otherwise remove such as come up close together to places that are thinner of plants. Lettuces of all sorts require similar treatment. The earliest celery should also be sown in a frame, if at hand, or by partly filling a large pot with light rich earth, and covering it with a piece of flat glass, the seed will vegetate quickly and young plants may be had almost as soon as those reared in a hot-bed, and much

stronger; these should be transplanted to a bed of rich earth in the warmest part of the garden when the weather will permit their full exposure. A few turnips may be sown immediately, and again about the end of the month. Leeks also may be got in when the other seeds have been attended to, and from the middle of the month onwards plant potatoes, the earliest sorts first. Old roots of onions, carrots, parsnips, &c., kept through the winter, should now be planted for the production of seed; and cabbages, brocoli, or other similar things intended for the same purpose should be transplanted, burying the whole of the stem and inclining the head towards the north. It is always advisable to grow as much of your own seed as possible, because it can then be trusted; but the inexperienced must be cautioned against attempting more than one sort of any family, because of the danger of mixing them by impregnation; thus, two kinds of cabbages, or cabbage and brocoli grown together will be worthless, the passage of insects from one to the other when in bloom being certain to mix and spoil both. Among fruit trees, pruning and planting should be finished as quickly as possible, particular attention being paid to securely tying any that have recently been moved. Grafting should be done from the beginning to the middle of the month. Grapes, peaches, and other wall trees must be nailed in their places; the latter will require some slight protection from frost when coming into bloom. The best varieties of vegetables mentioned in the present calendar are — of peas, the scimitar, Knight's tall and dwarf marrows, Groom's dwarf, and queen of dwarfs; beans —Windsor and sword long pods; onions—Deptford, Spanish, Reading, and James' keeping; carrots—long, Surrey, and Altringham; parsnips—hollow crown; radishes—short top, and white and red turnips; spinach—round seeded or summer; cabbage —West Ham, Lewisham, and Battersea; brocoli—Walcheren, Chappel's cream, Miller's, late American, Danish, and sprouting; lettuces—brown, green, and

white cos; celery—Seymour's superb, and Plant's ponderous red; turnips—white stone, and early Dutch; leeks—London flag; potatoes—ash or walnut-leaved kidney, frame, Shaw, Victoria, to be followed by later sorts, as Regent's, York reds, &c.

FLOWER GARDEN.—Finish pruning roses and other shrubs. Ranunculuses, anemones, and gladioluses, or corn flags, should be planted without delay; sow hardy annual seeds, the common sorts in the open, and the finer kinds, such as stocks, asters, and marigolds, on a warm border, or underneath a hand glass. Dahlias may be planted if a frame to protect them is at hand, and the young shoots in that case should be taken off when about three inches long, and struck in a gentle hot-bed, otherwise the roots had better be kept until next month. Pinks, piccotees, and carnations should be finally potted or planted out. Pansies may be propagated under hand-glasses, as soon as young shoots can be obtained; those which have been kept in pots through the winter may be safely transferred to the open beds. Prune and nail climbers of all sorts; trim box or other edgings, or plant new ones; repair the walks when necessary, and endeavour to impart an air of neatness and finish to every part of the garden.

WINDOW PLANTS.—The whole of these plants will be benefitted by re-potting. Geraniums and fuchsias delight in light rich earth; calceolarias, (lady's slipper), roses, the chimney campanula, and others which grow as freely, should have a larger proportion of loam; whatever manure is added to either should be thoroughly decayed. The pots should be perfectly clean inside and out; take care to have each properly drained with pieces of slate or potsherds, in size and number proportionate to the pot; the larger ones require from one to three inches of this drainage. In removing the plants, take off the matted fibres with a knife, loosen the soil moderately, and when in its place, press the new earth tightly round it; give a gentle watering, and keep them rather warm for a few

days, afterwards they should have plenty of air on fine days, and water as they become dry; station each where it may receive the direct light, and pay particular attention to keeping the leaves clean.

APRIL.

KITCHEN AND FRUIT GARDEN.—In heavy clay lands and exposed situations, it is sometimes impossible to get forward with the sowing, and thus the main crops are left till the present month. Within the next fortnight, however, the whole of this work must be completed, or such things as carrots, onions, and the earlier kinds of peas, cabbage, and brocolis will prove failures. To keep up a good succession, two sowings of peas should be made in the course of the month, and an additional one of broad beans will be found useful. The main crop of celery should also be sown about the middle of the month on a warm piece of rich ground, and the later sorts of brocoli will require to be got in at the same time. Small quantities of lettuce, spinach, and radishes may be sown at intervals of ten days or a fortnight, and a few onions to draw while young, or Normandy cress as a salad, may occupy some small shaded spot. Earth up the advancing crops of peas and beans, and place sticks to the former as soon as they are a few inches above the surface, they are required now as much for protection as support. The principal crops of potatoes are now to be planted as speedily as possible, even on the worst lands this work should not be deferred beyond the middle of the month. Give them plenty of room, for experience teaches us that *crowding* is false economy. An advantageous mode of filling the potato ground, which has been fully proved, is to place the sets in rows three feet apart, and take a crop of early cabbages or broad beans from alternate rows, by this method the ground is made to bear two crops, and yet each has abundant space; the cabbages being drawn before the potatoes require much

earthing, and the beans growing completely above them, do not interfere with the progress of the potatoes at all. Make plantations of herbs, either by dividing old roots or by sowing seed. Carefully thin young cabbage plants now rising in the seed beds, that none may be crowded, and remove weeds where ever they appear. Hoe turnips when the second rough leaf is seen, and should any of the crops present an irregular appearance, sow again in the blank places, or transplant such as are too thick, according to the nature of the produce. Plant Jerusalem artichokes in rows two feet apart, the poorest soil will do for them, and if cardoons are grown, the seeds should be sown five or six together, at intervals of a foot and a half, in trenches as for celery. The early spring-sown cauliflowers will now be ready for transplanting if they have been carefully tended, and should have a warm situation and rich earth; put three plants together and cover them with a flower-pot or something of the kind at night, and in cold weather till they are re-established. In sheltered places both French beans and scarlet runners may be sown, the latter are so prolific that a large quantity ought to be provided. Finish grafting fruit trees as quickly as possible, carefully guard the opening blossoms of peaches and other tender wall fruit from frosts, by covering with net or thin canvas. A substitute for these may be found in small branches of the spruce fir, which are usually stuck about the trees so as to break the worst of the weather: whatever covering is used, it should be removed daily, and replaced at night. Fork up the ground between strawberries, it is of much benefit to them at this season, and keeps the earth in an agreeable state.

Flower Garden.—Any kind of annuals may now be safely sown. An error of very common occurrence in connexion with these plants should be avoided: the seeds are very often sown too deep, and more frequently too thickly. The smaller kinds, such as the Virginian stock, require only to be just covered with

earth, and the thinner the covering the better will they vegetate; the largest seed should not be buried more than an inch deep, and all kinds must not be sown more thickly than the plants will stand when full grown. Tulips will want some protection from frost at night, or the flowers will be disfigured. Plant out and sow pansies; protect stocks, asters, and other tender things in cold weather, but beware of nursing them too much. Examine the buds of rose trees every two or three days, and destroy the grubs which will soon begin their ravages. Sweet-peas usually succeed better when sown in April than at other times; it is a good plan and a protection from mice to sow in pots for transplanting. Transplant biennials, and sow others for next year's supply. Auriculas will be coming into bloom, and when the better sorts are grown, some care must be taken to have them in good order; they require to be guarded from rain and cold, but must have plenty of air and water every day or two, according to the state of the weather. The soil about the necks of ranunculuses must be pressed firmly down with the hand, and where worms are troublesome, the beds may be sprinkled with lime water.

WINDOW PLANTS.—On the attention given through this month, most of the success for the season will depend. The plants are now, or ought to be, in very active growth, which must be encouraged by moderate and regular supplies of water and air. Pinch out the points of the growing shoots of such plants as are required to become bushy; this is commonly called "stopping," and with such things as geraniums, fuchsias, myrtles, and others of similar habit, is very necessary. Cactuses must have a sunny position and plenty of water. Mignonette in pots and boxes will require thinning so as to leave the plants about three inches apart. The several kinds of China roses form beautiful window ornaments, and occasion but little trouble; at this time they are coming rapidly into bloom. Look for and destroy

insects of all sorts every few days, they multiply so fast, that without constant attention, they are soon overrun. The leaves must be kept clear of dust, and the branches properly tied out to sticks, that the centre may receive its due share of light.

MAY.

KITCHEN AND FRUIT GARDEN.—A well arranged and properly managed kitchen garden in the month of May is a most pleasing sight, telling of comforts to be enjoyed through an entire year; nor are its present pleasures few or insignificant. The order, regularity, and forethought apparent in the outline and detail, impress the moral mind, and where the effect may be traced to the work of our own hands, it is surely pardonable to breathe awhile and admire.

Continue to sow peas, beans, spinach, radishes, and other crops in such quantity and rotation as may suit the space at command or the requirements of the family. The best peas for sowing now are Knight's dwarf, green marrow, Victoria marrow, or Groom's dwarf; they require but short sticks, and if sown as they are named at intervals of a fortnight, will give an abundant supply throughout the autumn. Either the green Windsor or long-pod beans may be sown, and of dwarf or French beans, a considerable breadth may be got in, for what are not used in a green state may be allowed to ripen, either for seed or as an addition to the culinary articles of winter: they are good boiled and eaten with butter, or as a thickening for soup; pigs, also, will eat them and fatten fast. They should be sown in rows two feet apart, or if three feet can be allowed, a crop of lettuce may be taken from between the rows, which, planted at the time the beans are sown, will be off the ground by the appearance of flowers upon the latter. Where pigs are kept, these two articles are of infinite service, the beans for winter feeding, and the lettuce to be given to young growing porkers in the summer;

either of them pay well for growing, if only for this purpose. Potatoes of the earlier kinds will require earthing up, and if any have yet to be planted, no time should be lost in completing the work. By the end of the month, many of the cabbage tribe sown in March and April will require planting out, particularly the autumn broccolis, late summer cabbages, and coleworts. Let the ground for them be well dug and manured, and supply them well with water until they have again struck root. Thin out the remaining plants left in the seed beds, keep them clear of weeds and in a growing state till the removal of the first crop of peas, potatoes, and cauliflowers in next month makes room for their final planting. Look over the onions frequently, keep them clean, and by the end of the month they should be thinned, if for large bulbs, to eight inches apart; but as very large onions are not always desirable, six inches may be regarded as sufficient for the production of the most useful. In hoeing, take care that the earth is not drawn up the stems of those remaining, as it prevents their forming bulbs. Thin carrots, parsnips, and beet to eight inches apart. If the spare roots are drawn out, instead of being hoed, they will be found delicious eating when boiled. Plant out the earliest celery in trenches three feet apart, and between each trench, lettuce, endive, or spinach may be grown in single rows; sow more celery, and transplant the second crop to a nursery bed of rich earth in a warm position, keep the whole well supplied with water, and if the leaves show the marks of an insect at work beneath the skin, carefully remove all the injured parts, or the mischief will increase most rapidly, and cause the destruction of the whole crop. Sow a small quantity of cabbage-seed to be used as coleworts; this should be repeated every month through the summer, that there may be no lack of plants to fill vacant ground as it occurs. The principal crop of turnips should also be sown whenever a few showers happen to give them a chance of vegetating quickly.

Place sticks to scarlet runners, or if intended to be grown without, nip off the points of the shoots as they grow; the produce, however, of plants so treated is not so great as when they are allowed to climb in their natural manner. With a frame and some hot dung the better sorts of cucumbers may be grown; but if they are to be raised without protection in the open ground, it is next to useless to attempt any other than the sort known as the "ridge." To manage this kind successfully, a trench three feet wide and two feet deep should be filled with stable litter, and the earth returned over it, on which the seeds may be sown four or five together, in holes a yard apart. With proper attention to watering, the plants soon come up, when they may be thinned by transplanting all but the strongest. The first crop of cauliflowers which stood through the winter should have the earth drawn about their stem in the form of a basin, and liberally supplied with liquid manure; the younger spring-sown plants may be planted out as they get large enough. Seedling plants of onions, carrots, cabbages, and other kinds must be carefully secured with sticks as they run up, and if any two kinds of the latter description seem likely to come into bloom at the same time, the least valuable must be pulled up. Gooseberries and currants will soon be liable to attacks from caterpillars; these must be destroyed as soon as perceived, or not only the present but next year's fruit will suffer. After selecting what may be deemed a sufficient supply for the next plantation all the remaining runners on the strawberries should be taken off to increase the size and quantity of fruit. The extra shoots of peaches and other wall fruit should be taken off, removing all foreright and useless branches, and such as grow over-luxuriant should be stopped by pinching out the leading bud; the same should be done to espalier trees, and those planted late in spring should have a coat of mulch spread over the roots to defend them from drought.

FLOWER GARDEN.—During this month the most active preparations for the summer's display must be made; all sorts of annuals, biennials, and tender plants, such as geraniums, fuchsias, verbenas, &c., may be finally stationed where they are to grow. Dahlias that have been forced, or the old roots kept dormant until this time may be planted and all the beds or borders thus filled with their summer occupants. Tulips coming into bloom should be guarded from wet and strong sunlight to preserve their beauty. Pinks and carnations require plenty of water; their stems must be carefully tied to sticks as they grow, and the number of flower-buds reduced if fine blossoms are desired. Ranunculuses also require plenty of water; continue to examine the rose trees for insects. Green flies are usually troublesome at this season; they are most easily destroyed by fumigating with tobacco, or tobacco-water may be sprinkled on the shoots. Auriculas should be set in a shaded place, and regularly supplied with water. Climbers should be neatly trained as they grow, for if allowed to run wild at this season, the confusion is beyond remedy before autumn.

WINDOW PLANTS.—As the influence of the advancing season and power of the sun begins to be felt, the management of window plants becomes easier, and must be gradually changed from the careful nursing hitherto necessary to a course of almost constant exposure that will render the plants robust and hardy. Those who really delight in flowers, are certain to have acquaintances of similar tastes, and now is a good time to collect cuttings of desirable kinds. The numberless varieties of fuchsias, of verbenas, geraniums, and roses may all be struck with ease, and the first and last named plants are among the very best for window culture: fuchsias bloom all summer and autumn, and China or tea-scented roses almost constantly. To manage the cuttings successfully, where no other convenience is at hand than can be supplied in the window sill, let them be prepared in the usual way,

by removing the lower leaves and cutting the base of the stem square immediately beneath a joint, then dibble them into a pot filled with sandy soil, having a thin layer of pure sand on the surface, water them moderately, and cover close with a glass, a cracked tumbler answers exceedingly well; set the pot in the warmest part of the window and shade it from the sun. The cuttings must be carefully tended with water, and dead leaves taken away as they occur, it will also benefit the foliage if the glass is wiped clean every morning. As soon as they begin to grow, it is a sign they have taken root, after which they ought to be potted out separately. There is a much greater variety of plants suitable for this purpose than is generally supposed. The chimney campanula *(C. pramidalis)* should have its stem thinned, leaving not more than three of the the strongest, and the plant be repotted into strong rich earth: keep it out of doors till the flowers begin to open. Cactuses will begin to show their gorgeous flowers; let them have abundance of light and plenty of water. Myrtles may be set out of doors to make room for other things, stand them in a sheltered spot. The lemon-scented verbena *(Aloysia citriodora)* and heliotrope, the dwarf kinds of lobelias, variegated and scarlet geranium should be re-potted, but the fancy kinds of the latter must be left until they have bloomed. Every pot must be regularly looked over daily, and supplied with water as may appear requisite, they must also have air every day, either by opening the window or setting them on the outside. The latter method is preferable in fine weather, but the *pots* should then be shielded from the sun. When inside, avoid draughts, which do as much harm to vegetables as to animals. Above all things, keep every leaf of every plant perfectly clean, it is easily done with a soft brush or sponge and clear water.

JUNE.

KITCHEN AND FRUIT GARDEN.—The crops for winter use of the several kinds of brocoli, and others of the cabbage tribe, will require to be finally stationed some time this month. A few showers will be of great benefit, and enable the plants to support the change; advantage should also be taken of damp weather to get out the main crops of savoys, kale, brussels-sprouts, and other things of like nature. It is often a matter of difficulty to find space for all that are to be transplanted, but as the winter supply depends upon what is planted now, we must get a second crop between the rows of such as are likely to come off the ground soon. The earlier peas and beans, or potatoes, may have any of the before-named vegetables set between their rows; the ground is thus made useful, and the recently moved plants receive the benefit of shade from their neighbours: the latter, however, must be taken away as soon as possible, lest the succeeding crop be injured. If the ground be poor, it is a good plan to dig a trench where the row of brocoli, &c., is to stand, and turn into the bottom of it a good layer of dung. The plants are then stationed in the trench, and the earth thrown out may be drawn to them at the future hoeings. In the same way, more celery should now be planted out; or to save room, make beds two or three feet wide, and place the celery in rows, one foot apart; there is a little more trouble in earthing them up in this way, but near a third of the space that would be occupied with the same number in single lines, is saved. Sow peas and French beans, so as to keep the crops coming on regularly one after the other, selecting for them a cool shaded part of the garden, as the beans are very subject to attacks of the red spider, when growing on hot dry land: the growth will be forwarded several days, if the seed be soaked in water for a day before sowing. Plant out the remainder of the spring-sown cauliflowers and cabbages. Sow lettuce, endive, spinach, turnips, tur-

nip-radishes, celery for late crops, turnips and cucumbers on ridges for pickling, and a sprinkling of cabbage for early winter use. Put stakes to scarlet-runners, and stick advancing crops of peas; keep the hoe continually going between growing crops of all kinds, it not only destroys weeds, but assists the plants, rendering water less necessary. The beds of onions, carrots, parsnips, and other close crops, must be finally thinned by the end of the month, leaving the first from six to eight inches apart, and the latter about a foot. Continue to ridge out cucumbers as they get two rough leaves, shade and water them at first, and as they grow, peg the branches down to the bed. Those under hand-lights will require more space, to afford which, lift the glasses and draw the runners out. Earth up potatoes, early celery, and cauliflowers; a few of the best of the last-named may be marked for seed. Water seed-beds and transplantings every evening in dry weather.

Among the trained fruit trees there is much to do this month; the summer pruning is most important, and must be well attended to. Peaches, nectarines, and apricots, bear their fruit upon one year old wood, a sufficiency should therefore be laid in for bearing next year; leading shoots, and well-placed moderately strong lateral or side branches, must be carefully preserved, allowing them to grow all summer without cutting; ill-placed, foreright, weak, or very strong shoots, are to be taken completely out. Where a vacancy occurs in the tree, and a very strong shoot is near, the shoot may be cut back to within three or four joints of its base; it will then throw out several branches to fill the space. Apples, plums, pears, and cherries, bear upon what are called spurs; the young wood that is not wanted to fill the wall should therefore be cut so as to leave a few of the bottom eyes, these will push forward the short branches which form fruit spurs: the same treatment is found to succeed with currants. Vines are trained on two systems; by one, the tree is kept full of young branches,

running from the bottom upwards; and in the other, they are cut away, the crop of fruit being obtained from spurs. If the first be followed, the proper number of strong branches springing from near the bottom, must be first selected and nailed in, for their whole length, whether they have fruit upon them or not, and the remainder should be stopped one joint beyond the fruit. By the pruning system, all are stopped a joint beyond the fruit, leaving only the leading shoots to extend the tree. For dwarf plants against low walls, the first mode is preferable, because they are kept thinner in consequence of the removal of all the old wood at each winter pruning: every branch preserved should be a foot-and-a-half from the one next to it. Strawberries will require plenty of water in dry weather. To prevent evaporation, and keep the fruit clean, straw or flat tiles should be laid round the plants. Newly-planted trees, will also want a liberal supply of water, and where caterpillars are doing injury, children should be set to pick them off.

FLOWER GARDEN.—Without particular neatness in the spot devoted to flowers, its intended effect is destroyed. Neatness is something more than the mere raking of borders and sweeping of paths; it is wanted in tying, trimming, and training the plants, and is to be seen even in the sticks employed; for a handsome plant may easily become an eyesore, if fastened in a bunch to an ugly disproportionate stake. A little attention at the beginning to these matters, soon induces a habit that will not allow an unsightly object to remain. As all summer-flowering plants may now be placed in the open ground, the beds and borders should be completely filled by the middle of the month: in arranging the plants, be careful to place the tallest and most rapid growers towards the farther side, and let each plant or group stand so as to be seen distinctly from the next. In giving water to newly-stationed things, give them a thorough soaking and leave them to dry again. If dahlias throw up more than one stem, remove the weaker, and fasten the strongest to

a stake. Take up tulips and other bulbs whose leaves are withering: dry the roots in the shade. Propagate pinks, pansies, double rockets, wall-flowers, &c., by cuttings, under a hand-glass. Piccotees and carnations require plenty of water, their opening flowers should be guarded from rain and strong sunlight. Keep the auriculas in a shaded place, and moderately moist. Finish transplanting annuals of all sorts: a few of the free flowering kinds may be sown to bloom late in autumn. Stocks, asters, marigolds, and similar plants, should have a warm position; the ground cannot be too rich for them. Keep a constant watch for insects, especially on the rose-trees: clip hedges as they require.

Window Plants.—From this time forward, till the middle of September, plants in pots may be placed out of doors; they are, in fact, better in the open air, than in the heated atmosphere of a room. Except in stormy seasons, they may stand out night and day, in some slightly sheltered spot. As a precaution against the effects of strong sunlight, it is advisable to place the pots in which the plants grow, into others a size or two larger, and fill the spaces between them with moss; for many plants, having slender fibrous roots, are easily injured by the heat of the sun scorching them through the pot. Such as stand upon the ground should have a thick layer of ashes spread for them, to prevent worms from creeping in: wash their leaves frequently with clean water, and remove insects. When any portion of the collection is kept in-doors, a window facing the north or west is to be preferred, and plenty of air must be admitted. As soon as geraniums have done flowering, they should be cut down, re-potted, and the tops struck to form plants for next year. This is a good time to propagate nearly all kinds of pot-plants, most of them strike with freedom on a warm border in sandy soil, covered with a glass, and kept moderately watered. Myrtles, and some other hard-wooded plants, may be struck by placing the cut-

tings for about half their length, into a phial filled with water. Seeds must be sown in light earth, as soon as they are thoroughly ripe.

JULY.

KITCHEN AND FRUIT GARDEN.—As fast as the summer crops are gathered, the ground should be cleared and prepared to receive those for winter use. In heavy or poor land, it is advisable to spread a good coat of manure, and dig it in; but if the ground be tolerably rich and porous, it is perhaps better to leave it undisturbed, as in sandy soils much trouble is occasioned in hot weather to supply a sufficiency of water, till the plants have recovered from the removal. This observation applies only to such as are transplanted, as for others that are sown, it is always best to have fresh dug ground. The main crops of brocoli, cabbages, savoys, kale, and winter greens, should be finally stationed without delay, as the first step to success is to have such things firmly rooted and of good size before cold weather sets in. Finish planting out celery, unless a small quantity be reserved for use late in spring; the previous crops will require earthing up every fortnight, after which they grow rapidly: the seed-beds and recently planted rows will require a great deal of water in dry weather. In small gardens, whose space does not admit of long-continued successions of any particular vegetable, it is always best to secure the earliest crops, they are more profitable whether for use or sale, and, therefore, the objectionable system of planting winter vegetables in August should not be practised, but advantage ought to be taken of the first rain which falls in this month, to get them all out. The same chance must be seized to make sowings of more French beans, lettuce, spinach, cabbage, turnips, late peas, and radishes, if required. Dig the ground for them and sow immediately, as a very great difference is made to the sprouting of the seed by getting it into the earth while the latter is

moist. The hoe must be kept going among growing crops not only to destroy weeds, but to loosen the earth, which is of equal consequence to the welfare of the roots beneath: draw the mould up to the stems of cabbages, cauliflowers, young peas and beans. The later peas should have sticks as soon as necessary, to support them upright, and the shoots of scarlet-runners that are poled should be trained and tied till they have taken firm hold, those grown without stakes must be pinched off as they get in the way. Keep onions, carrots, and parsnips, properly thinned and clear of weeds. Plant out a full crop of leeks, in drills, eighteen inches apart, and nine inches between the plants; give plenty of water. A small quantity of lettuce and endive should also be planted at intervals of a fortnight. Gather herbs of all sorts, and dry them in the shade. Garlic and shalots will be ready for harvesting as soon as the points of the leaves turn yellow; dry them in the shade, and finish off with a few hours in the sun.

The various plants left to produce seed must be watched, and the onions and leeks securely fastened to sticks, or they are liable to be broken down by winds. Birds must be scared from radishes and the cabbage-beds; lettuce and celery seed is to be gathered daily, in small quantities, as it ripens.

Among fruit-trees continue the directions given last month, to thin and arrange the shoots of wall-fruit, and if insects become numerous on these or on standards, hand-picking must be resorted to; or, if a garden-engine can be had, a powerful stream of water thrown with force against the trees will be of much service in displacing the pests, and if the ground is slightly dug over directly afterwards, a great number will be effectually got rid of. Two enemies of the peach and grape-vine, known as red-spider and thrips, are often troublesome in continued dry weather. They are so small as scarcely to be detected till their ravages become apparent in a number of small yellow blotches on the leaves. As a partial remedy,

sulphur may be dusted on the wall and under side of the foliage in the middle of a sunny day, or frequent washings with clean water are perhaps more effective. Trees that were moved in spring should have an occasional soaking at the roots, apply five or six pailfuls at a time, so as to wet the ground thoroughly. Examine the grafts of apples and pears put on last March, loosen the ties and stop the shoots where required. Bud the stocks intended for peaches and other stone fruit.

A matter too often neglected to the injury of young and newly-planted trees has now to be mentioned, it is the thinning of the fruit,—by this time the number of healthy specimens may be known, and without any other consideration than the health of the tree, all beyond what it may be fairly expected to ripen with ease should be removed; it is far better to wait a season for a full crop, than to cripple the energies of the tree at the first bearing, a condition from which it rarely recovers.

FLOWER GARDEN.—By this time we may suppose the ornamental part of the garden properly filled and the plants growing: there is yet much to be done, but as we carry with us the enjoyment of the season, the labour is lightened in regarding the effects of past attention, and a stimulus received from the anticipated future. Dahlias and other tall-growing plants should be securely fastened to stakes, the former will require thinning among the branches in order to increase the vigour of the remainder. Piccotees and carnations in bloom should be protected from the sun and rain; the side shoots should be laid to form the next season's stock of plants. Pinks, pansies, double wall-flowers, rockets, and other perennial plants, which do not produce seed, may now be successfully propagated by cuttings set under a hand-glass, or in a warm shaded border. Take up tulips and other bulbs as soon as the leaves turn yellow; some tact is required to save ranunculuses; the most proper time is when the leaves part readily from the roots with a gentle pull, it is

often before they are entirely yellow, and if left longer new roots are emitted, and the plant begins another growth, which materially weakens the next year's blooming. All bulbous roots should be dried in the shade, which allows it to be done more gradually and therefore better. By a judicious pruning in this month many of the earlier flowering shrubs, such as some roses, jasmines, and others, may be made to produce a second crop of flowers in the autumn. Fill up vacancies in the borders as they occur, and for this purpose it is a good plan to keep a few pots filled with annuals, or other quick flowering plants. Chrysanthemums will now be coming forward; separate those which are too large, and cut the stems back according to their strength, a few may be laid to form dwarf plants for flowering in pots; they require plenty of water, both in the ground and those which are potted. Auriculas and polyanthuses must be kept shaded and moist. Continue budding roses, and to increase the chances of success, it is a good plan to wrap some damp moss round the bud in very dry weather. Watering is an important operation at this season; the best mode of applying it is first to loosen the earth with a fork or trowel, and then give a good soaking that will reach to the bottom of the roots, and will serve for several days; a little and often never penetrates far into the ground, and only hardens the surface.

Window Plants.—Fuchsias in a growing state should receive a final potting, place them in large perfectly clean pots, using a mixture of turfy loam and peat, or leaf mould; train the shoots and water liberally. Geraniums that have done flowering should also be re-potted; they require a lighter soil, such as one part turfy loam, two parts of leaf mould, and the remainder sand. Cut down the tops to within two or three joints of their base, and set the plants in a warm sheltered place to induce them to grow again; the cuttings may be struck in a frame or hand-glass, and will form nice plants by next season. Cactuses should

be kept in a sunny situation, and have plenty of water. Camellias which have made their season's growth may be set out of doors to ripen. China roses may be repotted if requisite, and are easily propagated now, in the same manner as geraniums. Separate and pot violets for early spring flowering: keep them and similar plants, as the cyclamen, &c., in the most shaded place out of doors. The whole tribe of lillies are handsome window plants, and some of the dwarf Japan kinds peculiarly adapted for the purpose; they are just beginning to bloom, and should have plenty of air and water. The chinese primrose may be sown in pots of light rich earth, and if covered with a piece of glass, will vegetate quickly, and form nice plants by the autumn. Propagation of such plants as myrtles, sweet-scented verbena, or lemon plant, chimney campanulas, &c., is now easy, and should be attended to without loss of time. Water all the plants with regularity, and in quantities proportionate to their size and the state of the weather; but particularly keep the leaves clean by frequent sprinklings of clean water and sponging. The essential points in the culture of every plant, is to allow the functions of both roots and leaves to be carried on in a proper manner, the first by placing them in suitable soil, and the latter by clearing them of all impurities.

AUGUST.

KITCHEN GARDEN.—Complete the planting of winter and spring vegetables as quickly as possible. In dry weather much assistance is afforded to plants by "puddling" their roots; when they are drawn from the seed bed, dip them into thick mud, so as to coat the roots entirely over with it, then plant and water in the usual way. The main crop of cabbage for next year, and the winter's supply of coleworts must be provided this month; for the seed bed select an open piece of ground that has not borne any of the tribe for a considerable time before, not very rich in ma-

nure, and where the young plants are not likely to have clubbed roots. In the course of the second week of the month, let this be dug, and sow immediately; it is important to do it exactly at the time stated, for if earlier, the plants are likely to run to seed in the spring, instead of forming heads, and if put off till a later period, they are not strong enough to pass uninjured through the winter. It is always desirable to sow at least two kinds, the early York for the first crop, and a larger kind, as the Battersea, West Ham, or Emperor, to succeed it. Between the 20th and 25th of the month, cauliflowers should be sown to stand in frames or under hand-lights through the winter; in dry weather the seed beds of both must be carefully watered; but whatever the state of the ground, the seed must be got in at the times stated, or a great probability of failure will be incurred. Sow also the last succession of dwarf and broad beans, a small crop of carrots and onions for winter and spring use, radishes both long and turnip-rooted, the last crop of turnips, and about the beginning of the month, the principal piece of winter spinach should be got in; light rich ground, in a slightly sheltered situation, should be selected for the last; the seed should be sown in drills nine inches apart, and a few cabbage or brown cos lettuce may be sprinkled along with it. Plant out the remaining lettuce and endive; tie up to blanch the advancing crops of the latter and sow a few more. Continue to earth up celery at intervals of ten days or a fortnight. Take up and dry onions, shalots, garlic and other roots which have completed their growth. Thin and peg down the branches of cucumbers, and defend their roots from heavy rains by keeping the glasses over them, at the same time they must not want water. Gather herbs for winter use, and dry them in the shade. Look closely after the ripening vegetable seeds; the first ripe are always the best, and where they are produced in succession on the same plants, as is the case with celery and some

others, a sufficiency of the earliest should be secured, and the remainder thrown away; gather only when perfectly dry, and expose freely to the sun, till the seeds can be readily removed from the husks. Keep the hoe going, the benefit of which will be felt next spring.

FRUIT GARDEN.—The wall trees and espaliers require most attention; they must be looked over again and by following the previous directions, all ill-placed and superfluous branches will be removed, and the necessary quantity of bearing wood properly placed; by attending to this work constantly through the season, the vigour of the tree is economised, and the fruit, receiving additional benefit by the removal of unnecessary foliage, attains a greater perfection both in size and flavour. Finish the budding of stone fruits, except a large increase of any particular kind is desired, when the buds may be inserted as late as the middle of September with partial success. Ripening fruit of choice kinds should be guarded from wasps and birds by means of gauze bags or fine netting. Vines must be regularly watched. Keep the laterals from fruit-bearing branches, stopped at one or two joints from their origin; train those intended for next year's bearing neatly in their places, and see that none are cramped by the shreds becoming too tight. Thin the shoots from the centre of currant and gooseberry trees, and where raspberries have thrown up a great number of new stems, they should be reduced to about four. Continue the mulching about trees planted in spring, and let them have plenty of water in dry weather. Make plantations of strawberry runners and clear the old beds of the remainder, and fork the ground lightly between the rows.

FLOWER GARDEN.—Auriculas require re-potting this month; if any appear sickly, shake them out of the soil, wash the roots, and cut away all decaying parts; pot them in a mixture of leaf mould, turfy loam, or cow-dung reduced to mould, with sufficient

sand to make the whole quite porous. Carnations and piccotees should be layed without loss of time, and the shoots of dahlias must be thinned and tied out to stakes, so that each may have its proper share of light and air; reduce the number of flower-buds where they come in clusters. The budding of rose trees should be deferred till next month, those inserted in August usually make a weak growth, and are often blown out of their places, but in September they are safe, as they lie dormant till spring: lay moss and other dwarf sorts. Transplant and propagate biennial and perennial herbaceous plants of all sorts which admit it. Sow ten-week and intermediate stocks for early spring flowering. Polyanthuses, carnations, pinks, and pansies, to be raised from seed, should be sown now, the last on a piece of rich ground in a warm place, the others in pans to be protected through the winter. As soon as the cuttings put in last month are struck and begin to grow, they should be transferred to beds of light rich earth. Plant colchicums and autumn crocuses; sow a few annuals for late flowering, and look closely after ripening seeds.

WINDOW PLANTS need only a continuance of the attention recommended last month; let them have plenty of air, light, and water, with a slight protection from the mid-day sun; propagation may still be carried on successfully. Pot the Belladona and Guernsey lillies to flower in autumn, and the young plants of Chinese primrose should be placed three or four together in pots of light rich earth and nursed, to forward their growth as far as possible.

SEPTEMBER.

KITCHEN AND FRUIT-GARDEN.—The advancing crops of brocoli and other winter vegetables should have the ground between them frequently stirred deeply with the hoe, or slightly forked; this helps them forward very much, and the produce is benefitted to nearly

the extent of an extra coat of manure. The first and second crops of celery must be earthed up, as the stems rise a few inches beyond the previous moulding: once a fortnight is a general rule for repeating this work. The young cabbage plants sown last month should be thinned, and those drawn out dibbled into nursery beds of light rich earth; and as the ground is cleared of beans or peas it should be dug and manured in preparation for the main planting of cabbages. It will yet be advisable to sow a small bed of some quick-growing cabbages, such as Yorks, so as to have a supply of plants to make good any deficiencies that may arise, and to fill spare corners. An abundance of greens will help through the winter, in the event of a continued failure in the potatoes. The advantage of early planting will now be evident, as those put into the ground in March will be full grown, and may be taken up without loss, while the late ones must run the risk of another month or six weeks.

Draw the earth round the stems of autumn cauliflowers; the young plants sown in August should be transplanted into beds, and well watered till they have taken fresh root. The main crop of winter spinach, if not already in the earth, should be sown at once; and the supply of spring lettuce must be provided by sowing rather largely of either the brown cos or some cabbage kind. Prick out the young plants of previous sowings, both of lettuce and endive, and tie up the largest plants of the latter to blanch. A bed of onions to be used in spring should also be sown, and a few radishes, or small salad may occupy a warm corner of the garden. Earth up the later crops of French beans, and remember the closer these are gathered, the longer they bear: a few of the finer pods of scarlet-runners should be selected for seed, and if it is intended to save seed of the dwarf kinds, a row, or part of one, should be left for the purpose. Get up and harvest the several crops of onions as they arrive at their full growth: gather the remainder of the pot herbs, and look closely after ripening seeds. If the spring-sown

parsley is growing too strong, trim it partially. Hoe out the advancing crops of turnips to their proper distances; a few sown now will come in at a late period in spring.

Finish strawberry planting as quickly as possible, or the produce next season will be small. An occasional look over the wall and espalier trees will be sufficient to keep them in order till the end of the season. Ripe fruit must be guarded with nets or gauze bags from birds and insects, and that in an advancing state should be open to the sun as much as possible.

Flower-Garden.—There is less work, and should be more enjoyment in the flower-garden this month than at any other period. The pink beds should be formed and planted: loam, leaf-mould, and road scrapings, make the best compost for them. Layers of piccotees and carnations should be potted if of choice sorts, or the stronger ones may be planted where they are to flower. Dahlias are just now in perfection, keep the stems moderately thinned and securely fastened to stakes. Cuttings of verbenas and scarlet geraniums should be struck now to be preserved through the winter in store pots. Polyanthuses may be separated and potted, and auriculas must be constantly examined, to see that they do not suffer from too much moisture. China-roses strike freely this month, and a good stock may be provided to cover walls or flower in pots. Keep chrysanthemums neatly tied to sticks, and the same may be said of all plants requiring support, or the autumnal winds very soon destroy them. Look closely after ripening seeds, and be careful to gather them only when quite dry.

Window-Plants.—The geraniums cut down in July will now be pushing forth a number of young shoots; these must be encouraged as much as possible, by keeping the plants in a sheltered place, and duly supplying them with moisture. When the shoots have grown two or three joints, they should be stopped by picking out the points in order to render them bushy. The cuttings made at the same period will

now be fit for potting; put each one separately into a small pot, and treat them as the older plants. Young plants of myrtles, and indeed all others that are properly rooted, should receive similar treatment. Cinerarias are among the most useful of spring-flowering plants, and if a few seedlings can be obtained now, they will make nice plants with the treatment recommended for geraniums. Cyclamen, Guernsey, or Belladonna lillies, and Lachenalias should be re-potted; the first and last are very handsome spring-flowering plants, and the lillies are exceedingly beautiful through October and November; all of them are of reasonable price, and well worth adding to the usual stock of window plants. Fill a few pots with fibrous loam, and sprinkle them over with mignonette, nemophilla insignis, and intermediate stocks: leave the pots in the open air, and thin the plants to about three or four of the strongest as soon as they can be handled. Pot off China primroses, putting one plant into each three-inch pot. Encourage the chrysanthemums in pots with alternate applications of manure water; re-pot the strongest, and allow them all plenty of room, or the leaves are liable to injury. Set all the plants as they go out of flower in the sun to ripen their wood, but do not let them suffer from drought.

OCTOBER.

KITCHEN AND FRUIT-GARDEN.—The first business of the month should be, the clearing of all mature crops that are yet out, as onions, carrots, and parsnips, ridge-cucumbers, autumn cauliflowers, and the po-potato. Clear the whole away, spread a liberal coat of manure and dig or trench it in. If previous directions have been followed, there will be no want of cabbage-plants to fill the space thus gained; and the strongest may be drawn from the transplanted beds, and finally stationed in rows two feet apart, to form the first crop of summer-cabbage next year. The plants next in size, both from the seed-beds and among

those previously removed, may then be planted between the principal rows, to be drawn out in winter and spring as collards, and the remaining small ones may be pricked in thickly on some spare piece of ground, to be in readiness for filling any spaces which may occur through the winter.

The August-sown cauliflower plants will require attention in the early part of the month; if the garden contain a set of hand-lights, these should be placed on a warm border, previously well manured and dug, at about a yard apart, and in each nine of the strongest plants may be placed, six of which are to be transplanted in spring, and the remaining three will produce the first heads of the next season. If hand-lights are not at command, a frame should be provided, which being similarly stationed, the plants may be dibbled in about four inches distant from each other, the whole to be transplanted in spring, or what is better, the plants may be potted into three-inch pots, and so placed in the frame. These will turn out with the roots entire, and be nearly as forward as those cultivated throughout in hand-glasses. Frost must be carefully excluded, but on every favourable occasion the lights should be entirely withdrawn. Earth up celery as it advances, and plant out the last crop. The endive and lettuce-plants placed between the rows of the earlier celery will now be full grown, and such as are not immediately wanted, may be laid in light mould under an open shed. Thin and weed the beds of onions, spinach, and lettuce, sown last month; some of the strongest plants of the last should be planted at the foot of a south wall or paling, which will afford protection in severe weather. Cut down the stems of Jerusalem artichokes, and cover the ground with loose leaves, or dig up the roots and lay them by in sand. Continue to hoe up brocoli and all winter greens, as by keeping the surface of the ground stirred, weeds are eradicated, and the growth of the crops is greatly promoted. Finish hoeing turnips, leaving the roots from six to nine inches apart, and if

blank places occur in these or any other crops, fill them up with small cabbage-plants, they are sure to be useful, if only for the pig. Gather ripe seed as it comes to maturity, and endeavour to dry it as quickly as possible. The finest onions and carrots, or other roots required for the purpose, should be selected and set aside to be planted next spring, and wherever an extra fine cabbage or turnip appears, it should be marked for the same end: specimens of the cabbage tribe for seeding may still be planted, burying the stems as before directed. Thin autumn-sown parsley, and partially cut down any that is growing rank. Make new plantations of herbs where required.

In the fruit-garden, prepraration for planting new trees should be taken in hand without delay, so as to have the ground ready by the time the leaves fall. Gather the entire crop of apples, pears, and all other fruits, lay them in heaps as they are taken from the trees to sweat, after which wipe each one dry, and spread them thinly on shelves, or pack them in baskets in layers of the fruit and clean straw alternately. Filberts keep best in closely covered jars. Stone-fruit must of course be used soon after gathering as it will not keep.

FLOWER-GARDEN.—In the average of seasons, our autumnal frosts occur in the second week of October, and knowing this, we have to make preparation accordingly. A general clearance of every thing valuable and likely to be injured, must be made at once; geraniums, fuchsias, verbenas, and all other tender plants, must be taken up and potted, unless a good supply of young plants has already been provided, in which case we should give them the preference, and allow the least valuable of the older ones to take their chance. Scarlet geraniums, fuchsias, and salvias, generally remove pretty well, but the penciled geraniums, verbenas, and petunias, that have been turned out of pots, seldom survive the winter. Be careful to keep such as are taken up shaded from the sun, until they have made fresh roots; and avoid crowding the plants

at all times. Pot hyacinths, narcissuses, and other bulbs, for early flowering. Keep them in the dark till they have formed a good number of roots. Let those previously potted receive plenty of air, and all the light possible, and associate the mignonette, nemophilla, cinerarias, and other winter-flowering plants with them, keeping the whole just secured from frost and guarded from rain, but in the full influence of the sun and air. The whole of the preceding will belong to the section of window-plants in the next month, but at present are better in the garden, if they can be accomodated with a frame for occasional protection. Chrysanthemums are just coming into bloom, and should be nailed close to the wall, or if standing in the open ground it will be well to cover them with mats or cloths, when the nights are likely to be frosty. The mulch round the stems of the dahlias should be loosened, and as soon as the foliage is destroyed by the expected change in the weather, take up the roots and dry them for storing. Remove auriculas to their winter quarters, and see that they do not suffer from damp. The tulip-bed should be prepared for next month's planting.

WINDOW-PLANTS.—The principal endeavour among this class of plants must now be directed towards getting them into a state of rest; water very cautiously, give air whenever the weather will permit, and at all times let them enjoy whatever sunshine occurs, and uninterrupted light. Now that the respiring power of the leaves becomes lessened, it is most essential that every particle of dust be carefully removed; the surface of the soil in which they grow should be occasionally stirred to keep it clean and porous, and even the outsides of the pots should be washed for the same end. If it be necessary to stand the pots in saucers when the plants are watered, the waste which runs through should be regularly emptied away, as much mischief ensues from allowing the roots to remain in the water.

NOVEMBER.

KITCHEN AND FRUIT GARDEN.—Should it happen that any of the work appointed for last month remains yet in hand, no time must be lost in completing it, especially in the transplanting of any of the cabbage tribe, winter lettuce, or other things of the kind. In a well-managed garden no blank places are allowed; if part of any particular crop fails, and it is not possible to refil the spaces with the same article, plant something else in the unoccupied spots, as nearly of the same habits as may be, or at least that will come off the ground at the same time; thus, in the spinach or onion-beds, vacancies may be filled with lettuce, or among the brocolis, cabbage-plants may be introduced rather than leave a gap. These things being regulated, it will be time to direct attention to the preparation of the ground intended for early spring crops: it hardly matters what the quality of the land is, but it may be improved by deep trenching, and now that leisure offers, every bit of the garden not bearing a crop should receive a good stirring; a thorough trenching is equal to a coat of dung, but if we apply the manure and trench too, it is clear a considerable improvement will be effected. The mode in which this work is usually done is not the best; instead of laying the surface on the bottom of the trench, and turning the subsoil to the top, the whole should be thoroughly mixed, contriving to have the manure in the middle, or at the depth of a single spade from the surface; it is there where it will be of most use to the roots, and the whole body of the moved earth being of equal quality, they strike into it freely, and the plant grows without check. Transposing the earth, as it may be termed, by the ordinary method, places the best portion beyond the reach of most roots, and where it is of no benefit even to the strongest in the earlier stages of their progress, while the poor, barren, bottom soil alone, is offered to the infant plant, at a time when it requires the most encouragement; the result

of this error has deterred many from repeating their trenching operations: but if they will try again, and mingle the upper soil with that from the bottom, the consequent increase of produce will amply repay the extra trouble.

In sheltered places, a few early frame-peas, and mazagan or long-pod beans, may be sown on ridges facing the south, which surviving the winter, will afford a very early gathering; but if the soil is naturally wet, or the situation an exposed one, it will be better to defer sowing till the spring. Continue to stir the soil in fine weather between all the larger crops, and finally weed the beds of small things. If carrots, parsnips, or other roots are yet in the ground, lose no time in taking them up: look over the potatoes already stored, and remove those that appear in the least diseased. Give plenty of air to cauliflowers under glass, whenever the weather will permit, but guard them carefully from heavy rains or frost. The full-grown celery should be earthed nearly to the top of the leaves, lest it receive injury from frost; the younger crops may be protected with loose straw. In the event of severe weather it is desirable they should continue growing, and hence the necessity of a little extra care.

If any alterations are desired in the fruit garden, let them be done at once, for fruit trees of all descriptions are removed at this season with much greater success than in spring. Commence pruning among apples, currants, and gooseberries. Un-nail wall trees generally, leaving a few of the principal shreds to support the branches, excepting vines and figs, which as they may require to be covered from severe frosts, should be gathered up in a way-most convenient for the purpose. Trim the raspberries, by cutting away the old stems, reducing the new canes to four or five of the strongest; shorten these to about three or four feet, and tie them neatly to stakes.

Flower Garden.—The summer occupants of this part of the garden being now entirely withdrawn, we

must set about clearing up for the winter. Look over the shrubs, prune away straggling or unripe shoots, and reduce the most rapid growers to a manageable size, giving to all a neat finished appearance. If the ground is of a clayey nature, the trimmings may be dug in as they are cut, and thereby assist greatly in rendering it porous. Herbaceous perennials that admit of separation, should be taken up and parted, and any that appeared misplaced in summer should be transferred to more suitable positions. The borders being thus newly arranged, the edgings should be trimmed, and the ground dug. In the unoccupied spaces, plant crocuses, tulips, or other bulbs, and sow a few hardy annuals to blow early next season. The tulip bed should be prepared and planted in the course of the month: if the flowers were in fine order last year, get the roots into the ground about the middle of the month, but if they were coarse in colour, defer the planting till quite the end. Piccotees and carnations in pots should be protected from heavy rains, but allow a free circulation of air among them at all times, to ensure which, the frames should be kept a few inches from the ground, by placing a brick under each corner. Auriculas and polyanthuses may be associated in this treatment, but being a trifle more tender should be kept rather closer. The turban or Dutch ranunculus should be planted in the early part of the month, but the Scotch kinds are better left till spring.

WINDOW PLANTS.—The directions given last month must be closely observed throughout the remainder of the year. The great object being to keep the majority of the plants in a resting condition, that they may start the more vigorously on the return of genial weather. Winter or early spring flowering plants, such as violets, china primroses, cyclamen, and roses are, however, to be excepted from this rule; they are now in an active state, and must be encouraged accordingly. As soon as hyacinths and other bulbs, placed in pots last month, are become

pretty well rooted, they may be brought into the window, and being placed near the light will grow rapidly; those in glasses should have the water changed once or twice a week. Chrysanthemums in pots require plenty of water while in bloom, and when their beauty declines, the plants should be taken to a warm part of the garden, or placed in a light shed to complete their maturity.

DECEMBER.

KITCHEN AND FRUIT GARDEN.—Early peas and beans are always desired, and those who pride themselves on productions of this nature, should remember that the first step in their culture is the most important one. If the sowing recommended last month has been deferred, lose no time in getting through with it now. On moderately dry soils, sheltered from the severest weather, both peas and beans succeed in ordinary drills. If the garden be an exposed one, sow on ridges ranging south-east and north-west, the earth being thrown up at least eighteen inches, and the ridges two feet apart. If the seed is sown near the bottom, it follows that the young plants must be well protected from wind by the elevation of the ridge, and from wet by the drain formed by the trench below them. Traps for mice are required as soon as the seed is in the earth; the most effectual is the old figure-of-four trap;—when the plants appear above ground, increased attention must be paid to guard them from slugs and birds; dry ashes, soot, or lime, frequently applied, will keep off the former, and lines of worsted, nets, or what is better, because it serves also to shelter them from frosts, a thick screen of fir twigs on each side the row with the worsted on the top, where sparrows are numerous, will keep the plants safe. Such as come up weakly, without promise of resisting the weather, are better earthed completely over, and this course may be persisted in till next February without doing any

injury. Where the soil is naturally wet, and consequently liable to be much frozen, the best course will be to sow thickly on some warm spot, and cover with a hand-glass or frame; the plants so raised may be transferred to rows in February, and will be nearly as early as those sown out. The ridges spoken of being two feet wide at the base, admit a row of beans between each ridge, but peas should be sown twice that distance apart; and in the alternate hollows lettuce plants may be stationed, or a few radishes sprinkled over the face of the ridge, and covered with fern or straw. Cauliflower plants under hand-glasses or in frames must have abundance of air on every favourable opportunity, and lettuce plants treated in the same way will require similar attention: in the event of severe frost, it will be well to cover them additionally with mats or loose litter, but do not keep them confined for any long period, or damp will be more destructive than cold; when the frames are open, an occasional cleaning will be of benefit—pick off dead leaves, stir the soil, and sprinkle some dry earth round the stems, and particularly look after slugs. Full-grown lettuce, endive, and brocoli may be taken up entire, and laid in by the heels in a shed or in a sheltered part of the garden, to be covered as occasion may require from frost or snow. Roots of all kinds, such as carrots, parsnips, artichokes, beet, &c., if not already dug, must be got up without delay, and stored in sand. Look over the onions, as decaying bulbs speedily infect the sound ones; those which show signs of growing should be used first, as they will not keep. Earth up all the large standing crops, such as brocoli and cabbage, which may still require it, and if the small-headed plants of the latter appear to suffer from damp, spread an inch of dry earth between them, which will check it, and prevent injury from sweeping winds. Continue to earth up advancing celery; that which is full grown should be covered completely up. Keep the beds of onions and spinach perfectly clear of weeds, and occasionally

stir the surface with a small hoe. Make plantations of rhubarb and sea-kale; established plants of the latter may be covered to blanch, and with the aid of a few barrowfuls of fresh leaves, will soon be fit for use. Proceed with digging and trenching as previously directed, taking advantage of dry or frosty weather to get the manure in the ground, but do not attempt to turn it in when the earth is very wet or covered with snow.

In the FRUIT GARDEN, pruning, trimming, staking and tying will yet occupy attention; planting should be brought to a close, and every tree recently moved should be well secured to stakes, and a good coat of mulch spread over the roots. Apple trees, producing small or inferior fruit, decaying at the points of the branches or otherwise showing signs of debility, may often be improved by severe pruning; the bark should be scraped, and where the American blight is seen, cut away the loose pieces, and apply hot lime wash in which soot may be mixed to increase its strength, and give it a colour resembling the bark. Among pear-trees, however, the pruner must be more cautious, for if they are subject to much cutting, an unfruitful condition is induced. Finish the currants, gooseberries, and raspberries as quickly as convenient, and if any increase of the first two is required, set cuttings of the young wood taken from close to the old wood, and reduced to about a foot in length.

FLOWER GARDEN.—The pruning of shrubs, transplanting and separation of herbaceous plants, arrangement, trimming, and digging of borders should be completed this month. The more tender kinds of roses, as the china, Bourbon, and tea-scented, will probably require some protection shortly, the exact means will generally suggest itself on the spot: they may be taken up and laid in together, in order to facilitate covering, but it is better to do it without disturbing them if possible; mats, dried fern, fir-boughs, or hay-bands, are all recommended, and may be employed at the discretion of the owner; the only point of conse-

quence is to avoid covering so effectually, or continuing it so long, as to induce the plants to begin growing under their shelter. Look over last month's calendar, and bring up the work as speedily as you can; there is generally a good deal to do at this season, with unfavourable weather for its performance, so that without exertion a confusion may arise sufficient to mar the spring operations.

WINDOW PLANTS.—If the geraniums or other plants taken from the borders in autumn exhibit signs of rottenness, remove the decaying parts, and dust the wounds with quick-lime or sulphur; keep them comparatively dry and as much exposed to the sun as possible: air is essential whenever it can be admitted. Remember previous directions regarding the employment of pans; they are a most fatal source of disease and death when left with water in them. Water sparingly, keep the leaves clean, and wait patiently. Flowering plants must still form exceptions as mentioned last month.

MISCELLANIES.

HOW TO LAY OUT A COTTAGE GARDEN.

In the present article we propose to furnish a few plain and practical instructions on the formation of a cottage garden. Among chief considerations are the fences or inclosures: it is a deplorable fact that nine-tenths of our country gardens are disfigured by wide wasteful ditches, topped by a vermin-breeding, weed-spreading hedge, the space thus occupied to the positive loss of the owner, being not unfrequently equal in extent to the whole cultivated part; this kind of fence must be altered before either neatness in appearance, economy of space, or good crops can be obtained. If the ditch is a water-course, let the hedge be reduced to half its height, and the bushes thus obtained will generally be sufficient to form a drain. Clear out the bottom of the ditch, so as to give the water a good fall, then press the trimmings of the hedge into it, filling up firmly about a foot of its depth; cover the bushes with sods of turf, and cut down as much of the bank as will bring it to a level with the rest of the garden; such a drain will last for many years. Perhaps the best thing for hedges of this kind, where only four-footed trespassers are to be feared, is the evergreen privet; it is certainly one of the quickest growing plants that can be used, and as it will bear

any amount of pruning, may always be kept close and neat; it is also to be obtained with less trouble than most others, and if the purchase of sufficient to form a new hedge is not to be thought of, the nearest professional gardener, if a man possessing the usual kindly feeling of his class, will generally be able to supply cuttings enough to form a stock of young plants that in two or three years will go far towards the desired end. The inclosure we should prefer is a hedge of this plant, three feet high, and fifteen inches thick. We use this word because a privet hedge, properly managed while young, may be made almost solid; it should stand on a slight elevation, not exceeding a foot, and constant care must be given to keep it clear of weeds, which will have the double effect of preventing their increase, and that of insects also. Privet hedges may be clipped as often as the owner may think proper; but once established, three times a year will keep them in good order; they have an advantage over the 'quickset' in their more rapid growth, and in being evergreen, thus affording a more efficient screen from cold winds to the garden,—and they grow equally well in all kinds of soil, without needing a ditch. Of the other plants occasionally used for the same purpose it may be well to speak, though serious objections attach to them all. Laurels form a handsome evergreen fence, so does the holly and yew; but when it is known that a very few of the leaves of the first may prove the death of a respected neighbour's cow that unfortunately chances to browse upon them, it will seldom be adopted by the right-minded, at least in exposed situations; and of the others, we can only say they are so slow in growth, and so expensive, as to be classed in the latter respect with a wall. We come now to the arrangement of the garden; and to have it perfect, we must provide space for vegetables, for fruits, and for flowers; the proportions may vary for either, according to the taste of the owner; but where profit and pleasure are equally sought, perhaps the fairest distri-

bution will be to limit the flowers to one-third of the garden, choosing the part nearest the dwelling, and devoting the remainder to fruits and vegetables. These are commonly and properly associated, but the flowers should always be collected together, and kept quite distinct from the other portion, both for the sake of effect and better management. Poets, it is true, sometimes amuse us with rural scenes, in which gilliflowers mingle with cauliflowers, or the bean-blossom and rose are brought into such close contact as to emit a compound fragrance at once delightful and new; such an arrangement, or rather want of one, however, evinces either bad taste or carelessness, besides causing much more trouble in cropping and working the ground; indeed, the propriety of keeping them separate seems so evident, that we would recommend a division, such as a hedge of roses or fuchsias, to be placed between. In the kitchen garden, or that part intended to produce vegetables and fruits, it will be necessary, before any more be done, to thoroughly trench the whole, collecting, as the work proceeds, the large stones and such other matters as may be useful for making the paths. The surface soil and that from the bottom of the trench should be well mixed, and where necessary drains laid in at not less than three feet from the surface, or thirty feet apart. No time should be lost in completing this work, and being neatly finished, the laying out may be proceeded with. The first requisite is a warm border for the early and choice crops; this must have a southern aspect, and if at the foot of a wall, fence, or hedge, (if the latter is a clean one) so much the better. Six, eight, or ten feet may be the width of this border, according to the size of the garden and what it is to bear; the earth from the surface of the path in front should be thrown to the back of the border, so as to give it a slope towards the sun, and no trees or bushes must be allowed on or near it; here the early radishes, cauliflowers, dwarf-beans, lettuce, and such things will be produced. A border of the same, or any other size, may be continued round

the entire of the garden, and the inner space should then be marked out to form equal and convenient parts. The paths should be not less than three feet in width, or their edges will be continually liable to be trodden down, and though this may seem extravagant in a small garden, yet it must be remembered that a good path economises time and labour in carrying on the after-operations; their extent should of course be proportionate with that of the garden, but whatever it is, let them be well made, for one good one will be found more useful than several narrow and poor ones, which after a shower of rain will not bear the weight of a barrow, or scarcely that of a footstep. The edges of these paths should all be bordered with strawberries, herbs, or other dwarf plants; and about three feet towards the centre, the currants, gooseberries, or espalier fruit trees, should be planted in lines, to correspond with those of the path. The first two kinds should be placed about six feet apart, and the last about ten; the space between them and the edging will afford a nice border for transplanting celery, early cabbage plants, sowing winter onions and spinach, and a variety of things which require a little extra care at particular seasons, and as they may be got at readily, are constantly under notice, and as it were, detached from all other things. The larger or main crops will occupy the middle of the garden, and there also must the standard fruit trees be grown. On the selection and management of these we shall speak hereafter, therefore, for the present, it will be sufficient to mention the distance at which they are to stand from the south border before-named, and from one another; it should not be less than fifteen or twenty feet; if more room can be afforded it will be better, for one tree with space to develope itself will always prove more profitable than several crowded together. The presence of a wall or warm fence should be taken advantage of, to introduce some of the finer kinds of pears or plums, taking care to place the earlier sorts in the warmest aspect.

These fruits are to be recommended far before the grape-vine, because the return is more certain, and fine specimens of either will always command a good price, while the value of out-of-door grapes, even in the event of their ripening, is comparatively trifling. If a shaded or damp spot occurs in either corner, it cannot be better occupied than with black currant bushes or raspberries, as both these plants delight in such situations. For the flower garden, no positive rules can be offered respecting its arrangement; the owner's taste, directed by its size, situation, and other circumstances of like nature, must mainly determine the style, only it must be remembered to keep each part proportionate with the whole, and above all things avoid attempting too much, for unless this spot in particular is kept in the very best order, instead of reflecting credit and yielding a pleasure, it will prove the reverse. A porch with a seat in it, covered with roses, honeysuckles, or other climbers, is an appropriate ornament to every cottage, and will form a pleasant retreat in summer; or the same plants may be trained on the house-front, and a neatly-made rustic basket to fit the window-sill furnished with plants in pots, will impart an air of neatness and finish not otherwise attainable.

There are several matters which, though they rank only as conveniences, and are often overlooked, yet contribute materially to the success, and assist the working of a garden, and are therefore to be provided. The most important is a proper place to receive and prepare manure: for the sake of avoiding unpleasantness, it will be as well to remove this as far from the dwelling as may be possible, though it is by no means necessary that the compost heap should be the stinking unsightly mass so often seen; a more economical method of managing these matters will entirely prevent any nuisance arising. Lower the ground where the heap is to be formed a foot or eighteen inches below the surrounding level, and in the lowest corner of this hole sink a tub to receive the drainage, and to

this place bring all the refuse of both house and garden; manure, decaying vegetables, slops, grease, wood ashes, &c., should here be deposited in regular layers; and whenever the accumulations have risen a foot above the last deposit, sprinkle the surface with plenty of quick-lime, or a smaller quantity of salt, and cover the whole with three or four inches of some kind of earth, as different as may be from the character of that in the garden; thus, if the soil of the place is naturally light and porous, procure ditch scrapings, marl, or even clay, and on the other hand, leaf mould, road sand, or ashes, will be the best things to provide for heavy land. The tub before-mentioned receives all the liquid that may drain from the heap, and this will be found invaluable for watering cauliflowers or other strong growing crops, or if not wanted in this way, should be poured over the heap, so as to soak it frequently, and thus assist the decomposition going on. If all refuse is collected through the summer, and an occasional barrowful of dung added, the heap will have arrived at a considerable size by the autumn, when it should be turned; and being two or three times chopped and mixed together, there will be an excellent dressing provided to turn into the ground at the winter digging. Another convenience almost as necessary is a shed, or some covered place, to store away tools, sticks, roots, and such-like things.

Where only pump or well water is to be had for refreshing the crops in summer, a good sized tub should be fixed in a sunny place to receive the water some hours before it is used, in order to have it slightly warmed, as the chill imparted to vegetation by pouring on cold water from a deep well is very injurious. If bees are kept in the garden, it will be necessary to float a piece of wood in the tub, or some of them may probably be drowned in their endeavours to drink. Another apparently trifling matter, but which will be found to add much to the comfort of a garden is a supply of scrapers; not merely one placed by the house door, but several distributed over the

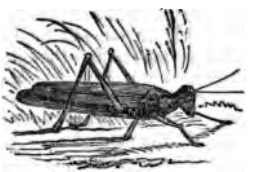
garden; a couple of stout stumps driven into the ground, and connected at top with a piece of iron hoop, form an excellent substitute for a more expensive affair. Bridges and boards to carry the barrow over soft ground, should not be forgotten in the list of implements, nor anything besides that will assist in maintaining neatness and order; for without attention to particulars of this nature, the garden will soon wear a slovenly appearance.

THE IMPORTANCE OF ORDER IN THE GARDEN.—The advantages of a well-selected plan of operations, or what may be termed a regular method of doing things, is nowhere more apparent than in the management of a garden; without it all is confusion and error,—crops misplaced or out of season, flowers few or entirely absent, weeds alone flourishing, and all of either pleasure or profit necessarily and totally lost; indeed it is impossible to cultivate, in the proper meaning of the word, any kind of vegetation, either in small or large proportions, without some definite and well-arranged mode of treatment, both as regards the seasons for particular operations and the manner of performance. Seeds may be sown and vegetate with all desired vigour, yet the result will be void unless the necessary weeding, watering, and transplanting be attended to in season; flowers may be grown and fruit produced, still without timely attention to the preservation of both, we lose the enjoyment of either.

To do what is required in the proper way and at the right time, is to preserve order; and to none is this more important than to those who have only their occasional leisure hours for gardening. In the absence of order, the work rapidly accumulates, and often the precious limited moments are lost in settling what is to be done first, searching for the tools, or otherwise preparing to begin. How often we may hear the exclamation, 'I should not fear the rest, if the roughest of the work was done;' but where a settled plan of action is regularly observed, there is

no rough work: a suitable job is always selected for the time at command, and finished without hurry before another is commenced; and as everything has a place, and can be found there, the work proceeds without interruption, yielding pleasure in its performance, and a gratifying result as the end. Order begets neatness, and those who have learned to esteem the one will never neglect the other: both are essential to the true enjoyment of a garden, for without a scrupulous regard to the finish only attainable by a visible neatness in every part, the richest collection will fail to please; while the humble cottage plot, with no other claim to notice than this one distinguishing trait, will afford the highest gratification to the discerning eye of a correct judgment. A man's garden may be looked upon as an index of his mind: sloth and ignorance go together. The intelligent, right-minded, and industrious man can no more endure an untidy, negligent appearance, than the idle one can arouse sufficient energy to clear away the rubbish which encumbers the ground, and renders his garden unprofitable.

Order is necessary, that everything may be done in due season; neatness, that all may be done well; and both, that we may enjoy the work which our hands have completed.



THE IMPORTANCE OF A PROPER CHOICE OF FRUIT TREES.

THE value of a few good fruit trees in every garden is or ought to be, well understood; but the folly of continuing the cultivation of inferior kinds is as difficult to explain as to remove. Poor trees are an annual source of vexation, and yet they are allowed to stand year after year, although acknowledged to be decidedly bad, rather than sacrifice a crop or two of worthless produce to insure a subsequent profitable return. To no one is the quality of fruit trees of more consideration than to the cottager and those who have only small gardens; for here it is of the first consequence to make the most of the allotted space, which can only be done by steadily adhering to the determination to grow nothing but the best; how then can the inferior kinds be tolerated? We sometimes hear, as an excuse for the presence of an unprofitable tree, that it was standing when possession was taken, and that the owner will not permit its removal. This is a frequent and at the same time injudicious proceeding on the part of landlords—though not a valid reason for the continuance of useless appendages to the garden. Improvement may still be effected by grafting, budding, or some other means known to the horticulturist. In the case of an old inferior variety of the apple or pear, nothing is easier than by crown-grafting (see p. 286), to cover it with a new head of the most approved kind, and thus in a couple of seasons convert the most austere and barren of trees into fruitful and healthy specimens, producing

crops of delicious and valuable nature. In a class of fruits so extensive as that of the apple or pear, it is easy to conceive the great difference existing even among the superior varieties; some are distinguished by their early ripening, others by their exquisite flavour, a third portion by the length of time they may be preserved, while only a few combine the most of these qualities; all are admissible and proper where there is room for them; but in gardens of limited extent, we must look for the combination of at least good flavour with keeping qualities, so that if the entire crop cannot be consumed soon after gathering, there may be no waste. Apples are to be esteemed before pears, because of their superiority as a culinary article; but even if an agreeable change of diet is considered of more importance than the production of dessert fruit, it does not follow that the cottager is to grow nothing but kitchen apples; it should be remembered that the finer flavoured kinds are as certainly the best when cooked as if eaten in the natural state. And as a further inducement to their culture, should there be some little superabundance, such kinds always realise a higher price than those which can only be used in the kitchen. Should any one doubt the fitness of dessert apples for cooking, let him taste a pudding made of northern greenings, one of the best kitchen apples, and then try another of Ribston pippins, and we do not doubt his declaring in favour of the latter. The same rule applies to pears, plums, cherries, and indeed all other fruits, and except to meet a large consumption of table fruit, there is no reason to cultivate the kitchen varieties at all, as selections may be made from the former which will ensure equal forwardness, productiveness, and keeping qualities, with all the extra advantages of superior flavour; in short, the best dessert fruits are the best for culinary purposes, and therefore always to be preferred in the garden.

The arrangement of trees in small gardens is also a matter worthy of serious consideration; if standards

are grown at all they should have stems of seven or eight feet in height, so as to raise the head so far from the ground as to allow of the latter being cropped beneath the trees, and wherever the growth of vegetables is carried on along with them, each tree should be at least twenty feet every way from its neighbour. Planting in straight lines that run from north to south is most advisable, as then each specimen receives its due share of early light and sunshine, and if kept apart about the distance mentioned, the shadow of the one never reaches to the next. The worst possible form for a fruit tree is the absurd half-standard, or those allowed to form round heads on stems only three or four feet high; the tree itself is not benefitted in any way by the adoption of such a form, while the ground below is rendered useless for crops. The best for a small garden is unquestionably the espalier form; trees of this kind trained by the sides of the paths are ornamental, occupy but narrow space, and though they do not bear quite such heavy crops as the standard, the fruit is always finer, in consequence of the increased light and air it enjoys. Gooseberries, currants, and raspberries treated in this way are wonderfully improved, especially the last, which then require no stakes; the stools being planted four feet apart, half the canes rising from each are bent to meet the corresponding half of the next stool, and there tied one lot to the other: this forms a series of arches, from the upper part of which the fruit hangs, almost clear of the leaves so as to have plenty of air, with just the requisite shade throughout its formation; while the new shoots to bear the succeeding crop are rising erect between each arch, robust and short-jointed, from the nature of their unconfined position.

The following brief list of fruit trees is selected as most suitable for small gardens.

Apples. *Aromatic Russet.*—Medium size, conical, green, tinged with russet, an excellent bearer, ripe in October. Known also as the Spice Apple, Burntisland Pippin, Rook's-nest, &c.

Blenheim Orange.—Large, tapering slightly from the base, yellow-green, tinged with red next the sun, rich flavour, perfumed, good bearer; in use from October to February.

Claggate Pearmain.—Rather large, conical, dull yellowish-green, tinged with brownish-red next the sun, first-rate flavour, abundant bearer; in use from November to March. If only one tree can be planted, choose this.

Court of Wick.—Scarcely of medium size, roundish, greenish-yellow deepening to orange, spotted with russet next the sun, high flavour, excellent bearer; in flavour from October to March. Known as Golden Drop, Phillips' Reinette, Fry's Pippin, Wood's Huntingdon, Knightwick Pippin, and Week's Pippin.

Devonshire Quarrendon.—Of medium size, roundish, deep crimson, crisp, juicy and pleasant, a good bearer; ripe in August. The best early apple, but does not keep. Sometimes named Sack Apple, Red Quarrendon.

French Crab.—Large, round, dark green, tinged with brown next the sun, firm, sharp, pleasant flavour, an excellent bearer, and will keep two years. Other names—Easter Pippin, Claremont Pippin, Ironstone, Young's Long Keeping.

Gravenstein.—Large, roundish, somewhat angular, pale yellow, streaked with red next the sun, crisp, aromatic and rich, good bearer; in use from October to December.

Lemon Pippin.—Medium size, oval, bright yellow, easily distinguished by the fleshy protuberance on one side the stalk, firm, brisk flavour, good bearer; in season from October to April.

Ribston Pippin.—Of medium size, roundish, tapering from the base, green-yellow, mottled, and streaked with brown and red, firm, aromatic flavour, tolerably good bearer; in season from October to May. Undoubtedly the finest-flavoured apple we have, but the tree is a bad grower, liable to canker, and seldom attains a large or handsome head. Known also as Formosa Pippin, Glory of York, and Travers' Pippin.

Sykehouse Russet.—Small, roundish, greenish-yellow, tinged with russet, deepening to brownish red next the sun, very rich flavour, good bearer; in season from November to March.

APPLE GATHERING.—The following is so useful a hint to fruit-growers, or rather to negligent fruit-gatherers, as to deserve attention at this season. It occurs in the *Botanic Garden and Florist*, in allusion to a valuable apple, on which it is said the cottagers of a certain district depend for the support of their families. "This tree," says the writer, "has the character of bearing profusely every alternate year, which in some degree is correct. This may sometimes occur from exhaustion, through excess of production; but we have observed another cause as tending to this effect. Its bearing spurs are exceedingly tender, and in the usual careless method of gathering fruit, nearly every spur that happens to have an apple attached to it is broken off, and two years are subsequently necessary to repair the injury! This gross negligence of breaking off the spurs with the apples cannot be too severely reprobated."

PEARS. *Autumn Bergamot.*—Rather small, roundish, yellowish-green, tinged with brown next the sun, dotted with grey, very sugary and rich, a certain bearer; in season through September and October. Other names—Bergamot, English Bergamot.

Beurré d'Aremberg.—Rather large, egg-shaped, tapering towards the stalk, very rich, melting, and juicy, succeeds as a standard in good situations, but is better against a wall; in season through December and January.

Chaumontelle.—Large, irregularly oblong, yellowish green, spotted with russet, which increases towards the sun, flesh melting, occasionally gritty, but in general excellent; in season from November to March.

Citron des Carmes.—Medium sized, egg-shaped, tapering towards the stalk, pale yellowish-green, tin-

ged with red next the sun, melting, rich, and perfumed; the earliest of all, as it is ripe in July.

Duchesse d' Angoulême.—Very large, oblong, inclining to egg-shaped, dull yellow tinged with russet, flesh buttery and rich; in season through October and November.

Glout Morceau.—Large, oblong, thickest in the middle, yellowish-green, dotted with russet, buttery, very rich and juicy; in season from November to January. Should be trained to a wall in exposed situations.

Hacon's Incomparable.—Large, roundish, pale green, streaked and spotted with brown, buttery, very rich and juicy; in season from November to January.

Jargonelle.—Large, long, tapering to the stalk, green, tinged with brown next the sun, tender and juicy; ripe in August. A good old pear.

Marie Louise.—Large oblong, tapering upwards, rather one-sided, a bright yellow when ripe, brownish, dotted with russet on the outer side, very rich, buttery, and vinous; in season through October and November.

Ne plus Meuris.—Rather small, roundish, uneven on the surface, dull yellowish-brown, dotted with russet, flesh buttery, melting, and sweet; in season from November to March.

To Promote the Fruitfulness of Pear Trees.—The flowers often fall off without producing a single fruit. To prevent this, take a pair of scissors, such as are used for thinning grapes, and go over the bunches of flowers, or rather of flower-buds, as soon as they are long enough to allow the points of the scissors to pass between them, and thin them, leaving only five or six blossoms in each, according to the size, and preferring those with the stoutest stalks and nearest the centre.

Plums. *Coe's Golden Drop.*—Large, oval, yellow, spotted with crimson next the sun, flesh clingstone,

very rich and juicy, requires a wall in exposed situations only; ripe at the end of September.

Denyer's Victoria.—Large, roundish, oval, pale red deepening towards the sun, flesh free, rich, and juicy, a great bearer; ripe at the end of September.

Green Gage.—Of medium size, round, pale, ashy green, tinged with yellow, flesh free, very rich, juicy and luscious, an uncertain bearer; ripe at middle of August.

Prince of Wales.—Large, similar in appearance to the Orleans, of which it may be regarded as a variety, but as it blooms late is a more certain bearer; ripe about the middle of August.

Reine Claude Violet.—Medium size, roundish, purple, with pale blue bloom, flesh free, rich, and delicious; ripe beginning of September.

Royal Hative.—Medium, roundish purple, with blue bloom, and dotted or streaked with yellow, flesh free, very juicy and rich; ripe in August.

A FEW REALLY GOOD GOOSEBERRIES.

Bright Venus, Taylor's.—A middling-sized berry, white, obovate, or egg-shaped, the larger portion being next the stalk, hairy, and of first-rate quality; the tree has erect branches, and the fruit hangs till quite shrivelled. It is sometimes called Golding's White Sergeant.

Champagne, Red.—A small, roundish, red, and hairy fruit, very rich in flavour, may be kept good till a very late period: the tree has remarkably upright branches. Other names—Dr. Davis's Upright, Countess of Errol, and sometimes Red Turkey, and Ironmonger.

Champagne, Yellow.—Of the same general character as the last, except that it is a yellow fruit, and in good soil somewhat larger. Known also as Hairy Amber.

Crown Bob, Melling's.—Large, oblong, red, hairy of first-rate quality, and rather early; the tree is of spreading habit, and a good bearer.

Early Green Hairy.—In addition to the name, it is only necessary to describe this as a small round fruit, very good, and one of the first to ripen; the tree is rather small, spreading, and a great bearer. Other names—Early Green, and Green Gascoigne.

Farmer's Glory, Berry's.—An excellent variety, with large, obovate, red and downy fruit, very good in flavour, and generally an abundant bearer; the tree has pendulous or hanging branches, which should be kept thin.

Glenton Green.—Of medium size, oblong, green, and hairy, as also are the young leaves; the branches are pendulous, and generally bear well. Synonyme—York Seedling.

Golden Fleece, Part's.—Large, oval, yellow, and hairy, an improvement on the old Golden Drop, from which it differs in being better flavoured, rather larger and longer; the tree has pendulous branches and bears well.

Heart of Oak, Massey's.—A fine, large, oblong green fruit, quite smooth, and of rich flavour, and in addition, being a great bearer, should be extensively cultivated; the tree has spreading pendulous branches which, to produce the best fruit, should be kept thin.

Hebburn Green Prolific.—Resembles the last, except that it is rather smaller; the tree has an erect habit, and is a most abundant bearer.

Huntsman, Brotherton's.—Large roundish, deep red and hairy; though not quite first-rate in flavour, this variety is very generally grown for the large size and abundance of its fruit; the tree is of erect habit. Also known as Speechley's Rough Robin.

Ironmonger.—This when obtained true is a valuable kind; it may be known by its small, nearly round, hairy, and very deep red fruit; the quality is of the best, and the tree a most abundant bearer, with spreading branches and downy leaves. Also known as Hairy Black, and is often confounded with the Red Champagne.

Jolly Tar, Edwards'.—A very good variety, with larger, obovate, smooth green berries; the tree has a pendulous habit, and bears well, is often in the prize lists of gooseberry shows.

Large Early White.—An obovate downy fruit, much grown for markets because of its early character and the abundance produced; the flavour also is good; the tree is erect, and may therefore be planted rather thickly.

Laurel, Parkinson's.—Large, obovate, pale green, almost white, downy, and of excellent flavour; tree erect, and bears well. Other names—Green Laurel, Green Willow. A very close resemblance exists between this and two other kinds, known as Woodward's Whitesmith, and Boardman's Lively Green.

Miss Bold.—A good old sort, with very early, middling sized, roundish, red and downy fruit; tree spreading, and a great bearer. Often called Pigeon's Egg, and sometimes confounded with the Red Walnut.

Queen Charlotte, Peer's.—An oblong fruit of medium size, greenish white and hairy, of excellent flavour, and generally produced in fair quantity; the tree is of erect habit.

Red Oval.—A large hairy, deep red fruit, of average quality, and plentifully produced; tree spreading.

Red Rose.—This is longer than the preceding, less hairy, and of better flavour; the tree is pendulous.

Rifleman, Leigh's.—Large, roundish, hairy and red, of first-rate flavour; the tree is erect, a good bearer, and trained against a north wall, the fruit may be kept till October. Known also as Allcock's Duke of York, Yates' Royal Anne, and Grainger's Admirable.

Roaring Lion, Farrow's.—This also is a late kind, and one of the largest; the fruit is oblong, red, and smooth; its flavour, however, is only second-rate, and the tree is not so prolific as some others; branches pendulous. Known, also, as Great Chance.

Rumbullion.—Small, roundish, pale yellow, and downy, grown chiefly for use in a green state, the tree being an immense bearer; when ripe the fruit is of inferior quality; the branches are erect, and do not require much pruning. Other names—Yellow Globe, Round Yellow.

Shakspeare, Denny's.—Large, roundish, red, and hairy, of excellent quality, and generally producing a fair crop; branches erect.

Smiling Beauty, Beaumont's.—A large, oblong, smooth yellow fruit, good in flavour and abundantly produced; the thin skin of the fruit, however, does not admit of its keeping; branches pendulous.

Snow-ball, Adam's.—Large, roundish, white, and downy, flavour first-rate; tree pendulous and a fair bearer.

Tantararara, Hampson's.—Of medium size, obovate, deep red, and downy, as also are the leaves; flavour rich and pleasant; tree erect, but not a good bearer.

Walnut Green.—An excellent sort, with middle-sized obovate, deep green smooth fruit; tree spreading and an immense bearer, much grown for market. Other names—Belmont Green, Smooth Green, Nonpareil.

Warrington Red.—Universally grown and esteemed both ripe and unripe; fruit large, roundish oblong, red, and hairy; flavour good, and altogether one of the best late varieties. Other names—Aston, Seedling, Volunteer.

Wellington's Glory.—Large, roundish, white, and downy, skin thin, flavour very good; tree erect, and a great bearer.

Whitesmith, Woodward's.—An excellent old sort, fruit large, roundish oblong, white and downy, of ex-

cellent flavour, and abundantly produced; tree erect, and may be planted rather thickly. Other names—Sir Sidney Smith, Hale's Seedling, Lancashire Lass, Sheba, Queen, Grundy's Lady Lilford.

To DESTROY CATERPILLARS IN GOOSEBERRY TREES.—Gather dust from any turnpike road and shake it well amongst the trees, and the caterpillars will immediately fall to the ground. It is an excellent plan to dust the trees twice or three times a week, as it will effectually prevent the lodgment of caterpillars.

STRAWBERRIES AND RASPBERRIES.

THE months usually recommended for making new plantations of strawberries are September and October in autumn, or March in the spring. But we consider either season as disadvantageous. If planted in autumn, they often are not sufficiently rooted to stand the winter frost, if in spring, the produce has to be waited for through more than a whole year; whereas if planted in July, the plants become well established before winter, and a plentiful crop of fruit may be obtained in the following summer.

The soil best suited for the strawberry is a deep rich loam; stiff clay land is considered unsuitable, but we know a garden of several acres in which the soil is cold wet clay, planted entirely with strawberries, from which the crop is most abundant, yielding ample profit to the owner. The ground should be trenched two feet deep, well supplied with manure, and divided into beds about four feet wide, with narrow pathways between them. On these beds the young roots are to be planted from twelve to eighteen inches apart, according to the size of the kind of strawberry. The roots should be chosen from those

runners which grow nearest the parent plant, and which have a full central cluster of leaves, those with only one or two leaves are generally unproductive. Strawberries may also be planted in borders, at about a foot distant from each other, but the best system to pursue is the following:—

1st year, July.—Prepare the beds, and plant as above directed, fixing the roots firmly in the ground; give them a good watering, and continue to do so day by day, if the weather be dry, until they are well rooted; the usual rains at the end of July are generally advantageous in assisting the speedy growth of the plants, which will be well established before winter sets in. In the beginning of December, spread a thick coating of rich manure around the plants, to nourish and protect them from the frost. Fork in the manure in April, make the beds neat, and cut off the runners as they advance.

2nd year, July.—Let a new bed be prepared, planted, and dressed in the same manner; continue attention to No. 1 bed, which this year is in good bearing order.

3rd year, July.—Make another new bed: attend to beds Nos. 1 and 2 as before. No. 1 is now in full bearing.

4th year.—As soon as the strawberries have done bearing, dig up the plants in No. 1, trench the ground afresh, well manure, and replant. No. 2 will now be in perfection.

5th year.—Pursue the same course with bed No. 2. Thus year after year you will have a constant progress and succession, always two beds in full bearing, instead of leaving your beds to become worn out and unproductive.

By planting several varieties, and choosing different aspects, the strawberry season may be made to continue from June to the end of August. One successful cultivator digs trenches a foot deep, these he fills with stones about half their depth, upon these rich loam, well manured, is placed, and the strawberries

planted upon it. The stones are to prevent the roots from striking deeply into the ground, in order that they may have the full benefit of the manure, and of that which is spread over the plants in winter. The plan is found to answer admirably.

Soot is a fine manure for strawberries; spread about them in April, just before they blossom, it destroys slugs, and the rains carry into the soil the saline matters which act powerfully as manure. Rabbits' or pigeons' dung, mixed with short litter, forms the best winter dressing. At the beginning of the present century, there were only about a dozen or twenty different kinds of strawberries, now there are hundreds of choice varieties, from which to select in forming new beds. Keen's seedling a few years ago was regarded as the best, combining fine flavour and large size with abundant bearing. This has yielded the superiority to the British Queen, which is, perhaps, the best of all. The price of the plants is yearly decreasing; in 1848 they were to be purchased for 3s. 6d. per hundred. Another new variety of splendid appearance and flavour is the Black Prince, the price is, however, yet very high, 6s. for a quarter of a hundred. Many gentlemen allow their gardeners to give away the runners to their poorer neighbours; from this source, doubtless, many of our readers will endeavour to supply themselves with good kinds.

RASPBERRIES are generally planted too late. In forming new beds it is found that when they are made in October or November, several years elapse before they become very productive. Our plan is to plant as soon as they have done bearing, or as soon as the leaves begin to fade and curl; the canes are then as much at rest as at any period, and may be removed safely; they require plentiful watering until fully established. In the winter a good supply of manure must be put about the roots, to be dug in in spring, and the result will be a good crop of fruit the succeeding summer. Gooseberry and currant trees should also be planted as soon as the leaves begin to fade.

PROPAGATION AND GRAFTING.

THE chance of possessing a valuable or desired variety of either fruits or flowers often depends upon our being able to propagate it, that is, if the mode of increasing such things be understood; for cuttings, scions, or buds are frequently to be procured, when perfect plants are out of the question. The advantages which such knowledge occasionally confers are obvious, and therefore the following hints may be serviceable.

Grafting is the union of two distinct kinds, so that one is made to bear the other: it is effected in various ways, known in the profession as cleft, saddle, crown, whip and root-grafting, with some other modes; the first, third, and fourth methods are the most used, and for the propagation of fruit trees and other ordinary plants, are fully sufficient. The tree on which the addition is to be made is called the stock, while the new piece is termed the graft or scion. Grafting of deciduous species (those which shed their leaves) is best done a short time before the season's growth commences, the sap then flows rapidly, and the union takes place quicker and more certainly than at other times. Upon evergreens it is usually done in autumn, advantage being taken of the descending sap. Cleft-grafting is by far the easiest, and in the hands of a beginner most likely to succeed; it is not, however, so neat in appearance, because of the one-sided position of the scion; it is done by cutting a long tapering notch on the stock, into which the base of the scion is fitted, by cutting it in the form of a triangu-

lar wedge. Crown-grafting is a modification of the cleft graft, and is usually performed upon old trees that have become unsightly and require renewing in the head. To illustrate both with a familiar example, we will instance an old apple tree of an inferior kind, or diseased in the branches, in both cases to be improved by the formation of a new. In March, all the branches are to be cut completely away close to the main stem, and after paring the bark a little smooth, so as to take off the greatest irregularities, we proceed to crown-graft it. Having the scions cut from the young wood of a healthy tree, in lengths of about seven or eight inches, two sides of the lower end of each is to be cut tapering towards the bottom for about three inches of the length, so as to leave a sharp angle or ridge between the two pared sides, just as a stake is sharpened to drive into the ground. A cleft is then to be cut at the top of the stock, which will hold the angular side of the graft so that the edges of the bark on it may fit exactly into those of the bark of the stock. The success of the operation depends entirely on the degree of nicety with which this fitting is effected; it is by the bark the union is made, and to join properly, or at all, it is necessary that they touch at every part. Several grafts may thus be placed on one stock, according to its size, and after tying them securely in their places with bass or worsted, the upper surface of the stock, and the point of junction between it and the scions is to be covered with well-wrought clay.

Whip-grafting is decidedly the best for propagating young trees, or indeed anything else in which the diameter of the stock does not greatly exceed that of the scion, because, if neatly performed, the after-growth conceals the union, and the two are thus thoroughly incorporated. To continue the illustration, we will this time take a young apple-stock of some three or four years old, having a stem of less than an inch in diameter; this is to be cut off about six or eight inches from the ground, giving a slight

upward direction to the knife, and on the lower side of this sloping cut the scion is to be fixed. Grafts of the description before-mentioned being at hand, pare off three inches from the lower end, so as to leave the remainder like a *flat* wedge, by entering the knife at the proper height on one side, and bringing it gradually towards the opposite, to come out exactly at the the bottom. The graft is prepared at one cut, which is always better than repeating it, as it is essential that the cut surface should be quite smooth. A slice is then to be taken off the stock of a corresponding size, sloping it upwards, that when placed together, the edges of the bark may again meet in every part, and the scion occupy the place of the head of the stock which has been cut away. It is sometimes impossible to make both sides of the graft fit exactly, but at least one side must be true in this respect. A tongue is sometimes made in the graft, but as it is of no benefit, we shall not recommend its adoption. The severed parts being brought as nearly as possible in their places, they are to be bound tightly together and covered with clay, the use of which is to exclude air, and facilitate the flow of sap.

Root-grafting is resorted to only when other modes fail, and in ordinary practice is confined to the propagation of the finer kinds of plants and shrubs; it is, however, one of the most natural and certain methods and, moreover, has a peculiar advantage, inasmuch as in the absence of stocks, the roots of the same, or any allied plant, may be made available for its increase. Half-ripened wood is the best for scions by this mode, and they are to be united with a piece of root having fibres in a growing state, in the manner of a cleft-graft, to be covered either with hay or moss, kept damp, and returned to the ground or potted, according to the nature of the subject. A little nursing is of course necessary, because of the check given to the roots; but as soon as they resume their functions the graft grows, and the union is speedy.

Grafting by approach, or inarching as it is com-

monly called, is certainly the easiest of all, because the scion retains the assistance of its natural parent till established in its new position; by the practised hand, however, it is regarded as a bungling method, only to be allowed in difficult cases. To do it, it is necessary to bring the stock and the plant from which the scion is to be taken together, and, therefore, one or the other must be grown in pots, or they should be previously planted so near each other that their heads may touch. When the operation is to be performed, bring the two conveniently near each other, and with a thin sharp knife pare away a slice at the point of contact, from the stems of both stock and scion, as long as the nature of the subjects will allow, descending to nearly half their thickness; bind the two new surfaces thus formed together, and cover with clay or moss; the scion is not to be separated from its parent till the union with the stock is perfect. Such things as grapes, roses, magnolias, &c., are thus more easily operated on than by other modes.

Saddle-grafting is most useful for the partial renovation of trees that have become bare in places, and for wall trees or stone fruit, is excellent, and very neat in appearance. It is done in spring just before the buds start. Having selected a strong plump bud (or single eye) on a healthy branch, make an incision just through the bark about an inch below, and another at the same distance above the eye, for about half the circumference of the branch, connect them by longitudinal cuts, and with the flat haft of a budding-knife or thin piece of bone separate the bark and the bud from the branch. From the part of the tree it is desired to fill, a piece of bark is to be removed in the same manner, of the exact size of that containing the bud, which is to take its place, and when inserted should be bound round firmly with bass, and covered with moss till it begins to grow. So close an union may be thus made, as to be scarcely discernible in a single season, and branches may be thus introduced upon parts of choice trees that were before unsightly and barren.

ECONOMY OF MANURES.

Our waste of the most valuable manures would astonish some foreigners. A Chinese farmer who treasures for his land even the soapsuds in which his beard has been lathered, and who would not throw away the putrefying carcase of a cat, or the hair and bristles of a scalded pig, but would use all as an element of manure, and carefully collect every particle of animal or vegetable offal within his reach towards the fertilization of his soil, would stare at the thriftless neglect of the most powerful manures, which he might observe, not only in our cities and towns, but even in country villages and farmer's homesteads. The richest aliment for the food of plants is allowed to float away through sewers and ditches, to our rivers and the sea, as if there were no need of it, and the farmers who send to Peru for guano make no determined effort to collect manures equally good at home. The precious ammonia and phosphate of lime, which *pure* guano (for it is to be remembered that much of what is sold under this name is mere clay) possesses, are contained in our domestic manures, with which every town and village in the kingdom abound. The Belgians, who are much nearer neighbours than our tea-growing friends in the celestial empire, also afford us an excellent example in the economy of manures. How different in this respect is their management, whether they cultivate five or one hundred acres of land. A universal system of thrifty economy prevails among them, and the consequence is, that very indifferent soils are made to yield abundantly. In the

large farms there is a cistern usually under the stables, into which the liquid is conveyed from each stall through a grating; the liquid when sufficiently putrid is either pumped out into carts and conveyed to the fields, or drawn out into a second cistern divided from the first by a partition, with a valve, until it is ripe enough for use. Rape-cake is frequently dissolved in it. In the mean time the inner cistern is filling. The little farmer has the fluids from his cow-house, and every slop that the house supplies collected, either in large cask, or a pit lined with bricks, into which every kind of filth is thrown, or conveyed into it by a covered channel. By having a large number of live stock they obtain large quantities of solid and liquid manure. A common saying with them is, "No forage no cattle, without cattle no manure, and without manure no crop." And no people understand the art of collecting and economically applying manures better than the Belgians; it is by their economy of liquid manures in particular that they frequently raise two crops in the same year from the same piece of ground. By some of the Germans and Swiss also is the ammoniacal liquid, which fresh horse litter contains, so much prized, that they dilute the litter in water and convey the liquid to the fields, leaving the straw to undergo a second fermentation; or they use it to potatoes after the principal manuring principles have been washed out of it. The effects of rich liquid manure generally in forcing the growth of vegetables, but particularly of newly transplanted ones, are very remarkable. The fine specimens of vegetables exhibited at our agricultural and horticultural shows owe their enormous size and luxuriance principally to the application of liquid manure to their roots. Their food is presented to them in the form in which they can instantaneously imbibe it, and by feeding on it, their growth and nourishment are stimulated and maintained. A sprinkling of it over clover or any grasses has surprising effect; any one who has witnessed the vegetation of these crops after a top-dres-

sing of fermented stable litter, will judge of the power of the ammonia when washed by rain to the roots of the plants, and thus see the folly of letting any of it flow away from his yard through carelessness. Ignorance of the fact that plants can only take their food in a state of solution is, at least, one reason why so many farmers and cottagers in the United Kingdom think only of providing solid manures for their crops, and allow the liquid essence of them to flow off from their dunghills with every heavy shower, and to evaporate from the pools in which it may have been deposited.

As to the millions of tons of town manures, both liquid and solid, which are often unavoidably, on the score of health and cleanlines, discharged into streams or rivers, we may find great difficulties in rescuing them from waste, unless, indeed, the charred peat of Mr. Rogers should become the means, as it probably will, of preserving these rich treasures, the loss of which we feel so severely.

But what excuse is there for the waste and mismanagement of manures in rural localities where their accumulation cannot be injurious to health, or offensive to decency?

The fact is, that where good examples of clever management, in this particular, are afforded by intelligent individuals who understand the nature and value of manures, and the results from their economy are made manifest, some neighbours will no doubt profit by what they see; but many will not, and in numerous districts there are no such examples to be met with.

The want of cisterns or any proper reservoirs for the liquids of farm-yard manure is notoriously general. We have seen farmers pile up fermenting manures from the farm-yard on the margin of a common, until it was their convenience to transfer it to a field, and take no means whatever of preventing the escape of the dark-coloured liquid flowing from it during the rains of two winter months. And at the same time, we have observed cottagers industriously scraping up

manure from the road, for their little field allotments, and yet not taking the trouble of collecting in tubs the liquid essence of the farmer's manure, which lay in a pool close to them. Now, the farmer highly valued the solids, but disregarded the liquids of his dung-heap, and the cottager seemed equally insensible to their value; this, of course, must have proceeded altogether from ignorance of the nature of manures. The man who would value a wheelbarrow full of dung as the means of producing for him, perhaps, four crops in succession on a perch of ground, disregarded the more essential parts. We never walk out in winter without tracing the essence of manures flowing from the ill-constructed farm-yards of the farmer, and the pig-stye of the cottager, though both might provide against such waste, the one by having proper cisterns and contrivances for preventing rain water from damaging the manure in his yards, and the other by having a cask sunk to receive the liquid manure, and a cover to protect his dung-pit from the rain.

THE MILDEW IN WHEAT.

This disease, often attended with fatal consequences to our staple grain crops, originates in a minute fungus, or mould, whose sporules (seeds) float in the atmosphere until, in favourable conditions of the air and plants, they are deposited on the latter, and increase and develope themselves with such rapidity as to damage or ruin the crop. The leaves of a wheat plant are covered with numberless small pores extending over their whole surface, as also that of the stem, which perform the office of respiration, and frequently of absorption. These pores, or as botanists term them, *stomata*, in damp weather imbibe a great quan-

tity of fluid matter, and as it is exactly that state of the atmosphere which is most conducive to the spread of fungi, we are led to infer it is then the mildew makes its first lodgment, and entering by the pores of the foliage or stems, soon spreads its blighting influence through the entire system of the plant. As the first step towards the knowledge of a remedy is to be obtained by study of the disease, we must determine as far as the power of reasoning and analogy will permit, in what way an attack of rust or mildew begins, and then from the nature of the predisposing causes and their effects, endeavour to deduce a remedy. In support of the opinion that the blight commences as described above, the fact of its first appearance being observable in small cavities directly under the pores, and not at the roots, as in the case of "smut," may be advanced with much force, for all recorded observations prove it; and further, that mildew is always most prevalent in continued damp weather, on undrained land, and on thick standing "proud" crops. It is true, when these stomata perform their natural offices, they are only exhaling organs, giving off the superfluous moisture taken up by the roots; but when a dense atmosphere impedes their proper functions, the process of respiration is stopped, and as the nature of all fluids is to soak in, it follows that the moisture of the atmosphere being heavier than that which should be exhaled from the plant, forces the latter back into the channels of the leaves by its greater weight, and passing into the space thus formed, enters the germs of the fungus which constitutes the disease familiarly known by the term *mildew*. We find, then, three causes at work, all conducive to the infection of the crop and spread of the disease,—the state of the atmosphere, the condition of the soil, and last, though probably the most powerful, the crowded or over-luxuriant state of the crop. With the first we cannot contend on a small scale to any appreciable degree; but the two latter causes are entirely under control. It has been asserted that

over-manuring is to be regarded as a cause of mildew, and as a palliative, thick-sowing is sometimes recommended, a proposition to be viewed with much suspicion, for both facts and theory are opposed to such a remedy. Winter-sown wheat that has suffered severely in the plant, will often "tiller" excessively, and in such cases mildew is nearly certain to follow, not from being thin, but for the opposite reason; the great number of weak imperfect stems which then rise from a single root, continue in an unhealthy state, because of their insufficient supply of food and air, a condition that renders them peculiarly susceptible of atmospheric changes and of disease. Over-manuring may, from the superabundant vigour thrown into the plant in its earlier stages, induce too great a number of stems, or an exuberant amount of foliage, and the result will be the same as though the seed had been too thickly sown. In either case, a want of air among the plants prevents the natural growth, and predisposes them to attacks of mildew and every other disease. It is unfair to attach the blame to the land, when the simple method of thinning is neglected, and the farmer has only his own heedlessness to thank. There are a few plain laws which govern vegetation, which cannot be broken with impunity; the few who observe them avoid many difficulties; but the number of those who obey nature is indeed few, the mass of cultivators prefer to depend on a mere rule-of-thumb course of practice, in which they blindly continue a system that has perhaps nothing but antiquity to recommend it, and neglect the advantages opened to them by the discoveries of science. Customs are adhered to, not for their superiority, but because, as sagely remarked, "they are of the old school." Now, without the slightest intention to depreciate the value of anything because it has been long known and practically proved to be good, we must beg to remind such objectors to "new-fangled notions," that we live to improve, and without an endeavour to increase our knowledge, and so multiply the good that is on

earth, we miss the main end of our being. If science teaches us, which it does in the most convincing manner, that a certain amount of food is necessary to the roots of a plant, and a proportionate quantity of air to the leaves, by the aid of which the latter are enabled to prepare the food conveyed into the plant by the roots, we commit a great error when we reduce the supply of either. Disproportion is unknown in nature; and crowded plants, whether of wheat or any thing else, are in the condition of twenty men thrust into a space that will only hold ten. The action may be slower, but the result is the same; their food is useless or injurious, because they have not air wherewith to assimilate it, they engender disease and ultimately die. Prevention is ever better than a remedy. Let the number of plants be fairly balanced with the quality of the land, and all the excess be at once rooted out. Let each stem have a chance of receiving its proper share of light and air, and no longer try to make seven or eight stand where there should be but one. Such a course will inevitably banish mildew, and instead of shrivelled kernels that are all bran, the extra strength of the plant will be consolidated in the seed, and but little "tail" need be feared.

FARMING WORK FOR BOYS.

It is generally admitted that proper training of the young is one of the best means of reforming society; habits of industry, sobriety, and order, implanted in early life, are very likely to continue their good effects in later years. A praiseworthy attempt towards this desirable object has lately been made by Mr. Batson, of Kynaston Court, Herefordshire, an account of which, as gathered from his report in the county paper, will, we think, prove acceptable to our readers.

It appears that Mr. Batson, not being satisfied with the attendance of boys as day-labourers on his farm, made arrangements to take twenty of them entirely under his own care for four years, to clothe, feed, and train up to a proper knowledge of their business. The boys' age averaged between nine and fourteen years. "Each boy," says Mr. Batson, "was to be provided with two suits of clothes—one for working in, and the other for better use, also a complete stock of linen, shoes, &c.; and at the end of four years I send them back with a like equipment. The working-hours are from six till six in summer, and during the winter they work while it is light. The meal-times are at nine o'clock, when they have half-an-hour for breakfast; at one o'clock, an hour for dinner; and at six o'clock, when they have half-an-hour for supper; and the evenings are spent in education until nine o'clock, when prayers are read, and they retire to rest. The food consists of bread and milk, or bread and broth for breakfast; bread, meat, and vegetables for dinner; and bread and cheese for supper, with the addition of coffee and pudding on Sundays. According to the rule universally observed on my farm, no beer or cider is allowed, excepting during the hay and corn-harvests. The labour consists of the general farm-work; but I may more particularly observe, the planting or dibbling of wheat and other corn and root crops, and the hand-hoeing of corn, turnips, &c. The evening education is that of reading and writing, arithmetic, &c., and such religious and other instruction as time and opportunity will admit, in which, as well as their daily labour, they are superintended by a young man for the purpose, who was four years at the Woburn National School, and six years at the Duke of Bedford's farm, where he also worked in a gang; to which I may add, that I make it my duty to attend personally each evening to assist."

The average cost of each boy for clothing, schooling, ing, and soap, was £3 2s. 7½d. a-year, or 1s. 2½d. per week; and for food 2s. 9¼d. per week. Thus for 4s.

per week each boy was comfortably maintained, while the profit on their earnings fully repaid their employer for his exertions and outlay. A statement of the wages paid to boys and men shows on which side the advantage lies :—

BOYS.	MEN.
Wheat planting, 6 or seven boys, at 8d. per acre, 4s. 8d.	Not done in the county.
Wheat hoeing, 6 boys, at 8d. per acre, 4s.	Men per acre, 4s.
Turnip hoeing, 5 boys, at 8d. per acre, 3s. 4d. Ditto, second time, 3 boys, at 8d., 2s.	Ditto 6s. 6d. to 7s.
Mangold würtzel, 6 boys and 1 man plant 5 acres per day, say 1s. 3d. per acre.	Ditto 3s.
Cleaning and heaping Swedes, 6 boys, at 8d. per acre, 4s.	Ditto 6s.

"You will perceive," continues Mr. Batson, "that this statement is in favour of the boys very considerably. In planting corn there is a considerable saving of seed (which will, of course, vary according to the idea of the farmer as to quantity required;) the seed is all in the ground, and at the required distances apart, to admit of hoeing and weeding, and thus it requires less harrowing to cover the seed. The hoeing is as perfect as it well can be done by hand, and all the surface is moved—a system which is seldom carried out when it is hoed by the piece. In the turnip hoeing, the plants are at regular distances, and all the surface is moved, so that no weeds escape; and I believe that in a field of forty acres, a man might have crossed it in six places and not have found six double plants. Of incidental work I need say little more than to remark that in weeding, collecting couch, collecting turnips and potatoes, making hay, turning barley and other crops at harvest, picking stones from the land, &c., &c., the boys are peculiarly adapted, as these operations do not require strength

but care, and from their size the boys get so much closer to their work. But these are a few of the great advantages to be derived. Whilst my boys are learning to be good and skilful labourers, and to get their living, they are rescued from what are too frequently dens of immorality and vice, and are learning their duty towards God, and their duty towards their neighbour. They are learning habits of cleanliness, and a systematic mode of living, and may be, I trust, the commencement of a better race of men. You may ask —Is this system appreciated by the labouring class? I should say, most decidedly it is. I believe in three months after I had filled up my number I had refused as many as sixty applicants (some from a distance) and one poor woman walked twenty-four miles to get her boy placed with me, but my number was already made up. There is another great advantage. I must not omit to mention, that in keeping these boys I am consuming my own manufactures (wheat, pigs, sheep, &c.,) by which means I have the bran back on the farm; I have the butcher's profit on the sheep and pigs; I get the manure (night soil) on the land, and I keep my capital in my own country (my farm) instead of sending it abroad (*i. e.* the labour-market.) I believe I have given you every particular requisite, and I think the calculation very near. The only items I have omitted are milk (skimmed) which would otherwise go to the pigs, and garden-stuff which they have when in abundance. The calculation is from Sunday morning to Saturday night, and the boys live in the usual manner. The expense may vary, but I believe this is about the average. I have said nothing of the accommodation and expense of fitting up, but it is not great. There are also books, &c., which are those generally used by the National Schools, published by the Society for the Diffusion of Christian Knowledge. In these a sovereign will go a long way. This and the interest of capital invested in furniture, &c., when divided amongst twenty boys, amounts to very little per week; perhaps in all, 2s. per boy!"

CULTIVATION OF THE LETTUCE.—Mr. Forsyth, gardener to the Earl of Shrewsbury, at Alton Towers, tells us that in that county *boiled* lettuce is a common dish, and recommends an improved mode of cultivation, by which four crops a year may be regularly secured. He says, "Any lettuce will grow freely in the open garden after the 22nd of March; in any rich garden soil four seeds in a square foot are sufficient; three crops in summer off the same land, may easily be got, and if persons will go to the expense or trouble of transplanting lettuce many crops may be had; and as four will grow upon a square foot, and weigh, when young, half a pound each, every square yard of soil will produce, in the three crops in the season, half a cwt., which is 15 cwt. to the pole of ground, or 120 tons to the acre."

DAMP WALLS.—It happened during the summer of 1848 that I was called upon, in a distant part of Dorsetshire, to suggest some means by which the wet might be prevented from penetrating the external walls of a school-house that had recently been built in a very substantial manner, with bricks of the best quality; but where, owing to the elevated and exposed position of the building, it was found that neither increased thickness of walling, nor internal battening would answer to make the school habitable; and nothing but an external coating of cement was, by the proprietor of the building, thought capable of remedying so serious an evil. The ingredients were mixed in the following proportions:—three-quarters of a pound of mottled soap to one gallon of water. This composition, when in a boiling state, was laid over the surface of the brickwork steadily and carefully, with a large flat brush, so as not to form a froth or lather on the surface. The wash was permitted to remain twenty-four hours, to become dry and hard. Another mixture was then made, in these proportions:—half-a-pound of alum to four gallons of water; which, after standing for twelve hours, in order that the alum

should be completely dissolved, was then applied in like manner, with a flat brush over the coating of soap. I need scarcely mention, that we availed ourselves of settled and dry weather, during July, for these operations. I have now to speak of the result up to the present time, as to the success of the process. Within a month after the trial, there happened one of those tremendous south-west gales, accompanied by heavy driving rains, such as had formerly drenched the school-house, and obliged the inmates to put pails, cloths, &c., to catch the drippings inside. It is satisfactory to state, that the walls were completely proof against the rain; not a drop penetrated through during forty-eight hours of the most severe weather; nor from that time to the present, though repeatedly subject to like trials, have the walls admitted the least moisture, nor has the artificial coating suffered apparently the slightest injury. The liquid, when applied, formed a thin, scaly, or gummy-looking integument, perceptible only by close inspection, but producing rather a mellow appearance, such as a building obtains when covered with lichens. The rain splashes against the walls as against glass, and runs down the face in a similar manner.—*Mr. Ferny, Fellow of the Institute of British Architects.*

GIVING CHARACTERS TO SERVANTS.—As much misapprehension prevails, and some annoyance has been experienced by parties on this subject, it may not be without its use, to state, in accordance with our best legal authorities, that the character to be given of a servant must accord with the strict truth; for if a false *good* character be given, and the servant afterwards rob her new master or mistress, the person who gave such false character is liable to an action and to compensate for the entire loss; and is also liable to punishment in case of false character, under the statute 32 Geo. III. c. 86. For the protection of masters and mistresses, it has been legally decided that they are not obliged to give a discharged servant

any character, and no action is sustainable for refusing to do so. Where a servant has proved unfaithful, the safest and best course to adopt is for the master or mistress to decline answering any inquiries on the subject.

THE EARTH CHESTNUT.—This root is the indigenous growth of our soil, but, like the potato plant, before its introduction into this country as an article of sustenance, it is now neglected, and nobody thinks it worth while to have a plant, even in his garden, although it is as plentiful in its native and wild state as the potato is in Peru, or in the first place of its discovery, Yet by cultivation, in two or three years it will, I have not the least doubt, produce as large a quantity per acre of a root three times more nutritious than the potato, and at less than one-fourth the expense. The plant is known to almost every school-boy; it grows in old pastures, and is called in some parts jar-nuts, earth-nuts, or earth-chestnuts. The plant is like a small kex, rather larger than a parsley plant, and something like that also; it bears a white flower, and is to be found in almost all old pastures in any part of England. I planted some roots of these nuts (but they may be produced from the seeds as well) in the year 1840, and they came up beautifully; and in the summer, when I dug them up, I found some of them two inches in diameter, and nearly as large as a man's fist. I roasted some of them, and found them delicious. They something resemble in taste the sweet potato of Virginia, or roasted chestnut of our own growth. They are a rich vegetable production, containing more of the elements of nutrition than the potato by three times at least, and will be relished as well by the community, as soon as they can be introduced.

WHAT SHALL I DO WITH THE LEAVES?—What shall I do with my leaves? Are they good for anything? asks a correspondent. Do with them! good

for anything! Why, treasure them to be sure, as if they were coin of the realm; they are good for everything which a gardener has to do. They are the best of all shelter, the best of all materials for bottom heat, the best of all soil, the best of all drainage, the best of all manure. It is true they contain little or no nitrogen, but they rot quickly, are full of saline matters, on which everything that bears the name of plant will feed gluttonously, and from their peculiar structure will allow air to pass in and water to pass out with perfect freedom. If we wish to know what leaves are good for, we have only to burn them and see what a quantity of ash they leave behind. All that ash is as much food for plants as beef and mutton are for us. It is the material which nature is perpetually restoring to the soil in order to compensate for the waste which is produced by the formation of timber. In wild lands, trees are annually thus manured; were it otherwise, a wood would be a roof of life overshadowing a floor of death. If we can remove the leaves from our plantations, it is only because of the artificial richness of the soil in which they grow. This sufficiently indicates the value of leaves, which are in truth hardly less important in their death than they were in their life, though in a different way.—*Gardener's Chronicle.*

OBSERVATION AND STUPIDITY.—Two lads were set to work together in the garden of a nurseryman; both were honest and industrious. They performed, to the master's satisfaction, the work required of them, and remained long in his service. But between these two lads there was a great difference, and herein it consisted: day after day, and year after year, John went to the tool-house, fetched out his spade, hoe, rake or scythe, and used them as directed; and when done with, put them away again, without ever making an observation or asking a question, that would add one jot to his stock of information. In course of time, he must, through more mechanical

habit, have become more expert in handling his tools but it may be questioned whether in the lapse of years he gained one idea, even on the subject of his own calling. Henry, on the other hand, constantly observed what passed before him. He not merely followed the directions given him, but tried to understand their principle, and if he could not perceive it, civilly inquired of his master, or one of the elder men, *why* such a thing was to be done in such a manner? If he saw two men do the same thing in a different manner from each other, he watched the result of the two methods, and treasured up in his mind the comparative value of each. The handle of one of his tools was frequently broken; it was of willow wood. 'Perhaps,' thought he, 'this is not a suitable handle for the purpose, ash is more tough and close, and might answer better.' He fitted in a handle of ash-wood, and found it durable. This was a piece of knowledge that he could never forget. Then he made his remarks on the different soils and situations chosen for certain plants. He observed the modes of culture employed by the most skilful of the men. If an injury occurred, he endeavoured, if possible, to trace it to its cause, and guard against it in future. Thus he was continually acquiring practical skill and experience; and sometimes suggested a hint for improvement which his superiors found worth adopting. And can it be supposed that he, like John, would remain all his life a mere digging machine? No! his diligence and attention qualified him to rise whenever a vacancy occurred; his master felt pleasure in promoting him, and at the same time advancing his own interests, by securing so intelligent and faithful a servant. He has been many years foreman or superintendent of the whole concern, and is generally supposed to hold a sort of partnership in the property.

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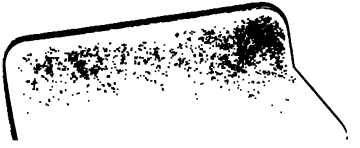

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